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ABSTRACT

This collection of conference presentations focuses on the twin themes of restructuring and technology in rural schools. Rural America's increasingly polarized demographics, political leadership voids, teacher training, renewal strategies, and ever-shrinking budgets are discussed, along with ongoing media criticism, which is a reality for all educators in the 1980s. Opening speaker Ron Knutson described many rural problems as being associated with an economic decline that contrasts with the economic upswing enjoyed by the rest of the nation. Four educational administrators from Western states placed the responsibility for improvement on state and local administrators and educators. The major topic in education today is restructuring. Stanford University's Michael Kirst observed that ideas challenging traditional educational models suffer in the current atmosphere of low public confidence, but he depicted schools as having little choice but to restructure. Arizona State University's David Berliner raised a different restructuring question: Why is so little attention paid to the role of research in transforming schools? Because of its promise for the rural future, technology took center stage on the conference's second day. But technology specialist Robert Pearlman cautioned that the mere purchase of high-tech systems is no assurance that education will improve. The processes of learning and teaching must be reassessed and new technology appropriately exploited to turn students into active learners. Pearlman proposed making technology-smart teachers the buyers of technology, in order to create and exploit a genuinely enthusiastic constituency for technology education. (TES)

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Looking ahead to the Year 2000

Issues for rural schools

Far West Laboratory

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Proceedings Papers Spring 1989

Far West Laboratory for Educational Research and Development

Editors
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BethAnn Berliner

Published July 1989

▪ *Far West Laboratory for Educational Research and Development serves the four-state region of Arizona, California, Nevada and Utah, working with educators at all levels to plan and carry out school improvements. The mission of FWL's Rural Schools Assistance Program is to assist rural educators in the region by linking them with colleagues; sharing information, expertise and innovative practices; and providing technical assistance to build local capacity for continued self-improvement. For further information contact BethAnn Berliner, rural conference planner and organizer, FWL, 1855 Folsom Street, San Francisco, California 94103, (415) 565-3000.*

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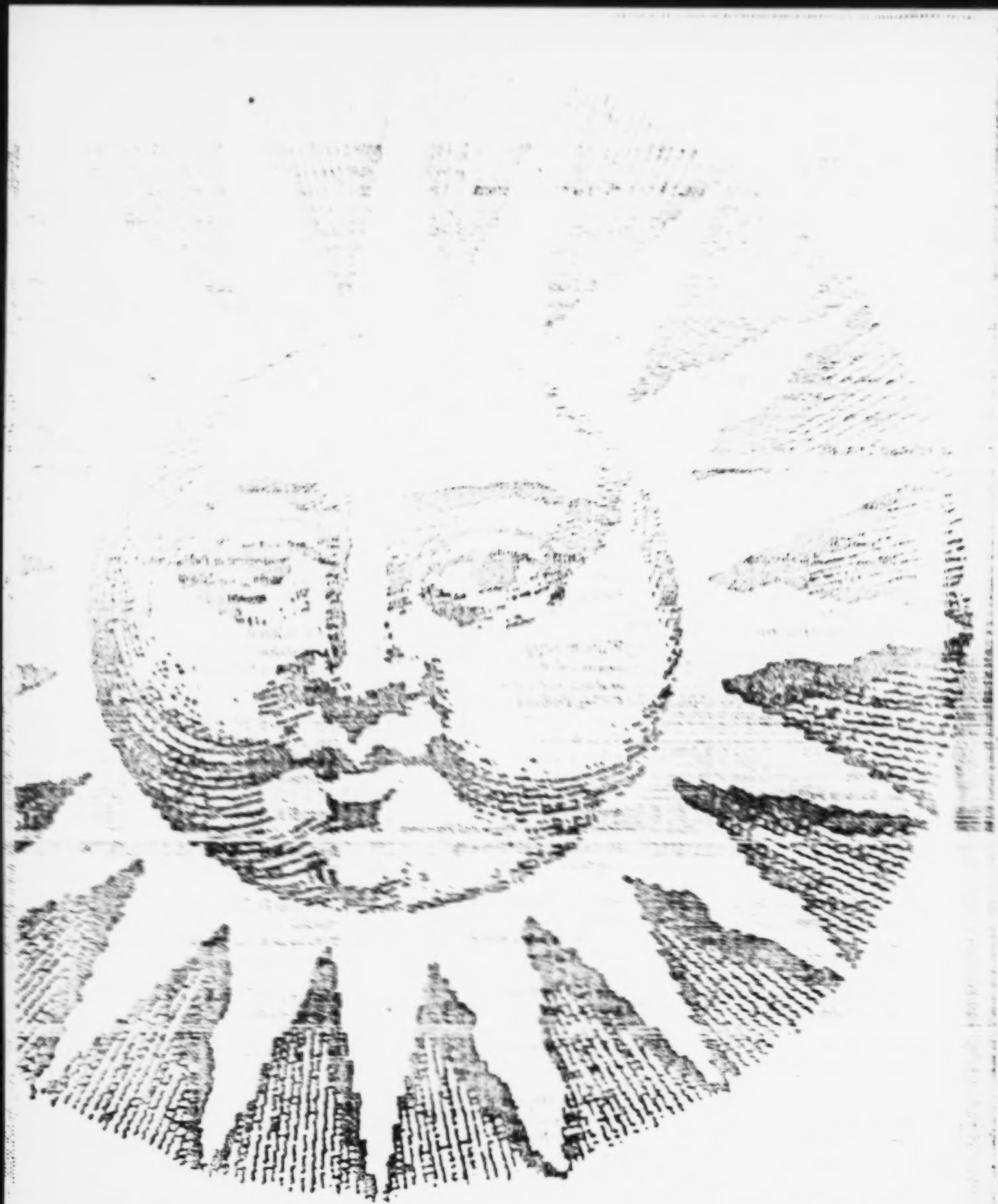

Looking Ahead to the Year 2000: Issues for Rural Schools

April 27 & 28, 1989
Tempe, Arizona

ACKNOWLEDGEMENTS ▪

▪ *Very special thanks to all the Rural Schools Assistance Program staff whose effort and support made the conference so successful. We could not have done it without the good humor and great skills of Debi Hertz. Design credit goes to Patricia Christen. And without the expertise, insight and commitment of the people on the following agenda, there would not have been a conference at all.*

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Director, Far West Laboratory

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Texas A&M University

Preparing for the Year 2000: State Perspectives
Diane Bishop, Arizona Superintendent of Public Instruction; David Gordon, California Deputy Superintendent of Public Instruction; Eugene Paslov, Nevada Superintendent of Public Instruction; James Moss, Utah Superintendent of Public Instruction.

Facilitator: Raymond Kellis,
Superintendent of Peoria Unified School District 11, Arizona.

Restructuring: Prospects and Problems in Rural Schools
Michael Kirst,
Stanford University

Career Ladders: Impacts on Teachers and Schools
Facilitator: Linda Nelson, Far West Laboratory
Panel: [illegible] Bachelor, Senate Education Analyst, Arizona State Senate; Glenn Davis, Assistant Superintendent, Dysart Unified School District #9, Arizona; Kolene Granger, Utah State Office of Education; John Bennion, Superintendent, Salt Lake City School District, Utah.

The Role of Community in Rural Schools
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Consolidation: The Lessons Learned
Facilitator: Mary Amsler, Far West Laboratory
Panel: Val Edrington, Superintendent, South Summit School District, Utah; James West, Superintendent, Ogden City Public School District, Utah; Reed Call,Superintendent (retired), Granite School District, Utah.
Discussant: David Coe, Far West Laboratory

What Does Restructuring Rural Schools Do For Students?
Presenters: Ivan Muse, Brigham Young University and Nancy Moore, Principal, Altara School, Utah.

Transforming the Teaching Profession
David Berliner,
Arizona State University

Improving Services for Rural At-Risk Students
Presenters: Larry Guthrie, Far West Laboratory and Paula Wilkerson, Director of State and Federal Projects, Calexico Unified School District, California.

An Integrative Approach to Curriculum Planning and Staff Development
Presenter: Janet Kierstead, Claremont Graduate School
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Preparing Principals for Rural Schools
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Mentor Teachers: Evaluators, Coaches or Somewhere in Between?
Facilitator: Judith Shulman, Far West Laboratory
Panel: Victoria Bernhardt, Chico State University, California; Scott Hays, Teacher, Coffee Creek Elementary School, California; Marguerite Granahan, Teacher, Pse Ho Tso Middle School, Arizona; Ann Harris, Teacher, Window Rock Elementary School, Arizona.

Educational Technology in School Restructuring
Robert Pearlman,
Educational Technology Specialist

The Great Basin Project: A Distance Learning Demonstration
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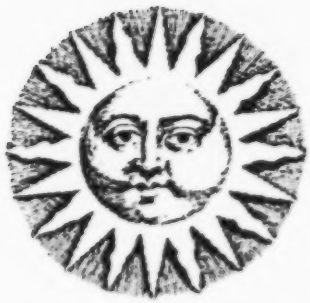
Training Teachers to Use Technology: The Belridge Experience
Presenters: Gary Peterson, Superintendent; Lee Phifer; and Becky Snyder, Curriculum Consultant, Belridge Elementary School District, California.

Bringing Technology to the Classroom on a Shoestring Budget
Presenters: Henry Jolley, Superintendent of Wasatch County School District, Utah and Todd Stubbs, Northeastern Utah Educational Services, Utah.

The Answers Are Only As Good As The Questions: Asking Better Questions About Technology
Presenter: Saul Rockman
Apple Computer

Technology and the Future
Presenters: Robert Pearlman, Education Technology Specialist and Saul Rockman, Apple Computer

Closing
Dean Nafziger,
Director, Far West Laboratory



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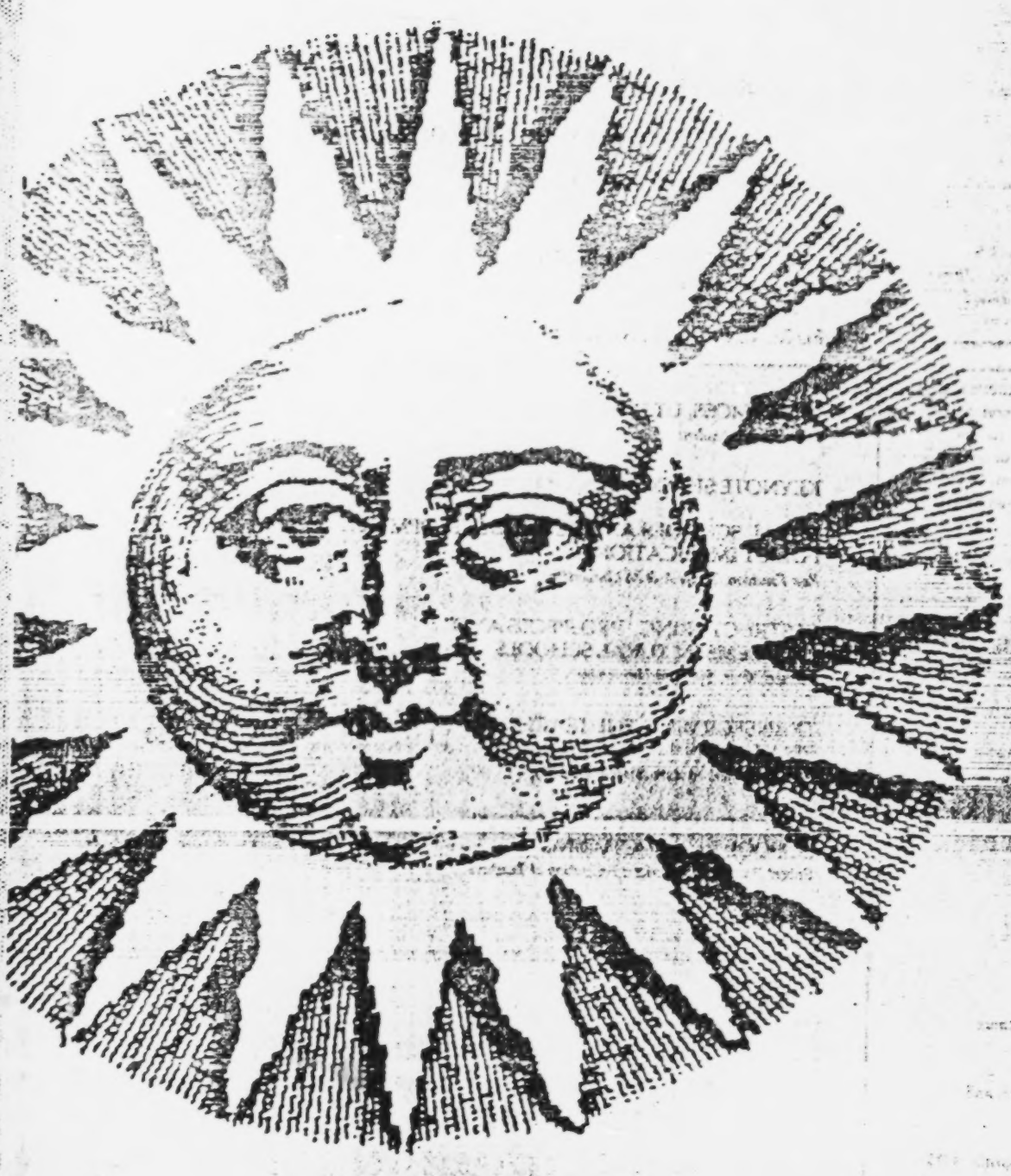


INTRODUCTION ▪

Looking Ahead to the Year 2000

It's an appealing notion, born of nostalgia. As urban schools struggle to cope with the upheavals of a rapidly changing world, the rural schoolhouse stands pristine, a throwback to a simpler era. Reality? The rural school today may not be a building at all but a fully carpeted, all electric metal case trailer in northern Nevada accommodating the sudden surge in students caused by a gold boom. Or in California, a once proud schoolhouse nestled the foothills may have fallen into disrepair because local voters are now mostly elderly and not interested in school improvement bonds. Or in Arizona or Utah—the rural school's insignia may no longer be a flagpole, but a flagpole flanked by a satellite dish.

Minus the smog of urban bureaucracies, rural education is bright with promise. Teaching here, and school organization itself, can be reshaped with fewer hurdles. High tech innovation is welcome—if made difficult by minimal budgets. Still, even the most remote schools haven't escaped the shadows cast by today's social and political ills. With growing frequency, rural educators are recruiting counselors and psychologists to help their students cope with urban-sounding problems—drugs, alcohol, teen pregnancy, suicide.

This spectrum of topics shaped "Looking Ahead to the Year 2000: Issues for Rural Schools." A first of its kind gathering of policymakers, scholars and practitioners, the two-day session in Tempe, Arizona focused 125 minds on the twin themes of restructuring and technology. The rural setting's increasingly polarized demographics, political leadership voids, teacher training and renewal strategies, and ever-shrinking budgets were all discussed, along with a reality for all educators in the 1980s—the steady drumbeat of media criticism.

National Versus Stateside Views

Opening speaker Ron Knutson, rural policy specialist from Texas A&M, gave a national perspective to rural economic dilemmas. As the rest of the nation improves economically, he said, rural areas are still on the decline. A "selective outmigration" of young adults leaves them with few leaders, lots of kids and a voting block of older citizens unlikely to endorse schools spending. That plight is compounded by Washington policymakers who confuse the farm problem and the rural problem and then are unable to fathom why $20 billion in farm spending doesn't stem the tide of rural decline. "Basically," Knutson asserted, "we have no rural policy"—which helps explain rural education's funding problem.

The burden falls to the states, and the view from the four western region states was outlined by their top education officials. They spoke of a need for closer ties between rural schools and social service agencies as the problems of hunger, poverty and despair increasingly impede kids' ability to learn. They spoke of a need for intensive staff training, to enable teachers to implement creative new curricula and learning strategies. They spoke of finding ways to lighten the paperwork overload that burdens rural administrators. They urged greater schools accountability and decentralized authority so that the system can adapt to local preferences and conditions.

But the superintendents had one common theme: Technology, they all agree, is a godsend for rural education. To C. Diane Bishop of Arizona, it is the solution to the rural/urban equity problem. Telecommunications, she said, will make it possible for the rural school with limited personnel and funding to provide courses needed by only one or two students. California's deputy superintendent David Gordon agreed. Calling technology "potentially a big money saver for all schools," he encouraged educators in small districts to finance high tech investments by forming partnerships with their larger counterparts. In that way, his state hopes eventually to install satellite dishes at all of its schools.

Nevada too envisions a statewide telecommunications network. Superintendent Eugene Paslov, addressing both human and economic concerns, sees this as essential for keeping rural graduates competitive in the university and the workplace. Utah's James Moss, who oversees the nation's most comprehensive teacher career ladder experiment, views technology as essential to rural participation in that effort. "Technology can turn a generalist teacher into a specialist," he said. That

teacher is then able to meet the subject matter requirements mandated by the state legislature, thus keeping him or her on a par with urban colleagues. Moss, like the other superintendents, called for links between schools and business to hasten the rural adoption of tele-learning systems.

Restructuring

The hottest topic in education today is restructuring, and a series of concurrent workshops allowed conference participants from school superintendents to principals and board members to examine a range of restructuring activities: Career ladders, consolidations, school/community alliances and teacher empowerment strategies.

Stanford University's Michael Kirst, meanwhile, put the term into perspective by calling it "one of those words that means everything and nothing." Kirst noted that of all the 20th century's "bold new ideas" in education, those that last are the ones that don't tinker with the basic model, while attempts at structural change tend to "zoom in and out of the Bermuda Triangle." Yet for all his skepticism, he depicted schools as left with little choice but to restructure. In the six years since *A Nation at Risk* triggered the 1980s reform movement, press criticism of education has not relented. Schools intensified their homework and graduation requirements, but widely published reports of American kids' failings in geography, science, and economics led to a public perception that any reforms made so far have fallen short of the mark.

In this climate, Kirst worried that educators resisting the "bold and new" risk losing public confidence. He advised more intensification, this time by revising tests and stepping up staff development. As for restructuring measures, he urged proceeding only after considering three questions: How will you finance this? How will you free resources to begin it? And—most important—does it have a constituency?

Arizona State University's David Berliner raised a different restructuring question: Why is so little attention paid to the role of research in transforming schools? When medical research shows a new drug reducing heart attack recurrence by one percent, the finding is hailed as a miracle. By contrast, a one percent differential in an education study is barely noticed. "Medicine has a great criterion—dead," Berliner said. "Education relies on measures like 'above grade level.' But when we have a one percent higher retention rate, that's life and death to the kids of this country as well. Thousands of kids will be affected by a variance just this small." He urged educational researchers to extrapolate their data and make projections—to point out, for example, that billions may be saved on future prison budgets by spending more now on early childhood programs.

The Rural Future: Tele-Schools

Because of its promise for the rural future, technology took center stage on the conference's second day. Early on came a demonstration of just what is now possible under the rubric of distance learning. The conference attendees in Tempe were connected by three-way audiographic hookup with Sara, a high school student in remote northwestern Utah, and her biology teacher 125 miles away who used his electronic pointer on the big color monitor to show Sara—and those at the conference—how the jaw parts of a grasshopper move and how wind and weather affect the artistry of a spider spinning its web.

Unquestionably impressive. But technology specialist Robert Pearlman was quick to caution that the mere purchase of such a system is far from insurance that education will improve as a result. In a presentation interspersed with videos, Pearlman told of telecommunications equipment gathering dust at schools—in part because schools often take a backwards approach to its acquisition. They buy systems and hope people will use them, he said, instead of first rethinking the learning process and then "exploiting the technology" to turn students into active learners.

To show how it ought to work, he described a nationwide experiment involving 200 elementary schools whose students studied acid rain in depth. The kids used computer technology to analyze data and create color-coded maps of U.S. acidity levels. In the end, they had "more data than the EPA"—along with the notion that learning is exciting, relevant and something you *do*.

Pearlman suggested similar rural projects. With "the multi-media sandbox" of camcorders, VCRs, computers, televisions and editing equipment kids could make a film telling the story, say, of a local polluted river. They'd be exploiting technology to document evidence and make public presentations. In other words, they'd be building the very leadership skills that rural areas strongly need.

As for technology's constituency, Pearlman proposed a "crazy idea": Make technology-smart teachers the buyers, and you'll create an instant constituency.

As the decision-makers, these teachers would automatically have a sense of ownership. That would lead them to create new ways of using their purchases to improve teaching and learning. "They'll become collaborators in each others' development"—to the point of team teaching over long distances with teachers in other states. Their know-how and enthusiasm, transmitted to their students, is technology's true bottom line.

Clockwise from top left:
David Gordon
Diane Bishop
James Moss
Eugene Paslov

C. DIANE BISHOP

State Superintendent, Arizona ▪

I would like to talk about some of the issues that seem to be relevant to the rural and small schools of Arizona, and some of the activities that we have underway to try to address those issues.

Giving Administrative Support

When I first took office in January 1987, one area of concern to me and to other members of the Department was rural and small schools. We tried to identify what some of the problems were and what we could do as an agency to help out. Our in-house task force studied the issue and discovered that one area in which we could really provide some service was communication. We want to ensure that the rural and small schools are able to receive information rapidly from the Department of Education. If they have concerns they need to express, we want to be sure that there is a specific contact person for them. Conversely, we need a specific contact person when we have information to disseminate.

That idea gelled into a rural and small school task force team of 40 department professionals. Each one has responsibility for one, two, or three rural schools. We serve all 90 school districts. And every school has the name of a person in the agency who "belongs" to them. They can call and voice concerns or get any information they need. Likewise, we can use this channel to send information out. This service is a tool that works well for us, providing continuity by having a familiar voice and face identified for each school and district.

Growing out of this communication system is more administrative support. Many of our schools are very small. We have a legislature or state board that can mandate things for us to do. Many times these mandates require a lot of paper work, an activity that must be added to the daily work of running a school district. That puts a real strain on the small administrative group that might be running rural and small schools. So we have proposed making better use of our rural county school superintendents. Perhaps these individuals, or someone in their staff office, could take on some of the day-to-day administrative functions for the rural and small schools—like dealing with budget issues or with federal reports required for special and vocational education—thus relieving the small districts of some of their burden.

This would take some legislation—to redefine the duties of the county school superintendents and perhaps free up some possibilities for this kind of interaction. But it's something we are interested in doing, and the dialogue continues.

Finding Innovative Ways to Meet Teacher Shortages

Another area of concern is the supply of skilled teachers. We at the State Board have the responsibility not only for issuing certificates, but also for revoking or suspending them in cases of unprofessional conduct or other circumstances. A great many of the cases we deal with have to do with contract breaks, and most of those come from the outlying areas—the rural and small schools. People sign on in the summer to take a job in a rural area. They go and start the job, but maybe after a month or two they find out it's not what they want, or something better comes along, and they break the contract and leave. This puts a real burden on the schools.

We also have the problem of how to get individuals with certain expertise out to some of these areas. The state of Arizona has a number of endorsements in place—in bilingual education, English as a second language, gifted education, and art, for example. Teaching in these areas requires specialized training. And there aren't enough specially-trained teachers to go around. Often, those who have the training don't want to reside in isolated areas.

To deal with this problem, we developed an alternative certification plan which was recently put in place. The districts are just now becoming aware of its possibilities. It allows schools to hire people who have expertise but who lack formal training from a College of Education—someone making a career change, for example, or perhaps the spouse of another professional. This person could be issued an alternate certificate,

and—after a period of mentoring—can actually become a fully certificated teacher in the state.

This is a relatively new concept, but we have had a fairly good response to it. We're hopeful that in the future, as more districts become aware of what it can do and how to go through the process, we will see more of these people in our field.

Another issue is educational equity—the old story about the urban versus the rural. This is not an issue of quality education. Our rural and small schools in Arizona are doing a tremendous job of providing quality education for their students. It's an issue more of diversity than of quality. When you only have one or two students who need or are desiring a certain course, how do you provide that when you don't have the personnel? How do you provide it when you don't have the financial base?

Linking Through Telecommunications

One way is through telecommunications. This is probably the most comprehensive thing going on in the state. We are involved in a major cooperative effort between the Board of Regents which has responsibility for our university system, the State Board of Education for the K-12 schools, and the State Board of Community Colleges. This cooperative is charged with assessing the status of telecommunication in the state—how much hardware is out there, where is it located, how much software is there, what kinds of activities are different districts and schools engaged in? The goal is to guide the development of a statewide telecommunications effort.

Ideally, we would like every district to be able to access all kinds of information across the world. We would like to have communication, via data processing equipment, directly into the Department of Education, and—likewise—back out again to districts. We also want to expand learning opportunities through distance learning. All of these efforts are part of the goal.

We have recently gone through a process of looking at the kinds of equipment and services that are needed in the K-12 area. The cooperative then is going to do a massive inventory of all state needs. The Department of Education recently went on-line with the McGraw Hill Information Exchange, which allows the Department to electronically communicate with schools and allows districts to electronically communicate with each other. This is in a pilot stage, but it is our intent to collect required reporting information and disseminate materials and resources electronically to schools directly.

If you would like more information about how you can get on-line with us, Kathryn Kilroy is the person in the Department who is heading this.

We're also pursuing the idea of having all libraries in the K-12 system electronically linked, perhaps as soon as this summer. With one resource index and agreements made to share resources, this will maximize the availability of library resources to the rural and small schools. And we would like to work toward agreements of a like nature with the universities and the community colleges and the county and city libraries so that all libraries are on-line and students have access to all of the information statewide.

Several of our rural schools are using the services of the Oklahoma State University this year. Additional rural sites—specifically in Cochise County—will join them in the coming year. The University of Arizona in Tucson now has 19 instructional television fixed service channels licensed through the FCC, and these channels will be used primarily by the Tucson schools. However, there is a link between Tucson and Sierra Vista—a rural community in the southern part of the state. Programming done in Tucson will be made available to Sierra Vista and all of the surrounding areas. Discussions are now in progress about the educational needs of those schools in terms of both student instruction and staff development.

Northern Arizona University (NAU) in Flagstaff has just signed an agreement with MCI which will enable a two-way audio-video link between Flagstaff and Yuma. NAU has a branch campus in Yuma and wants to use that mechanism to offer courses at that branch. The new system also links NAU and Arizona State University for the first time, and it may allow the K-12 system to share time for student instructional purposes and staff development.

Our cooperative has a bill in the legislature right now requesting support for a study of the statewide status of telecommunication. The study would look at what the cost would be to network the entire educational system. We're talking about audio, video, and data transmission—the whole thing. We're also in discussion with the other states who are here—Utah, Nevada, Wyoming and Montana—and with Far West and Northwest Labs and US West Communications to

determine whether we can all cooperatively offer educational programming in a multi-state effort.

So there are some exciting things on the horizon. We are moving very rapidly in the direction of a telecommunications effort statewide which will address many of these areas—to improve instruction and to better serve small and rural schools.

DAVID GORDON

Deputy State Superintendent, California •

I'm delighted to be here on behalf of our superintendent, Bill Honig, who is pinned down in our annual budget battle. In talking about some of the issues that we think will affect rural schools in the next ten years, I'd like to start off by giving just a little bit of background on some of the demographics and the context for small and rural schools in our state. These things make a tremendous difference, both programmatically and politically.

We have 1,024 districts and 58 county schools offices, most of whose county superintendents are elected. We have 4.6 million students, and we're growing at the rate of 140,000 per year. That growth rate is roughly equivalent to building a city the size of Stockton, California—or a little bigger than Tempe—in a given year. We spend about $21 billion a year from all sources on our schools. It costs us $900 million to $1 billion a year just to provide for inflationary increases and cost-of-living adjustments for schools. Ninety percent of our students are enrolled in 352 of our 1,024 districts. Thus ten percent are in the other 670 districts. We have 686 districts with fewer than 2500 students, about 500 districts with fewer than 1000 students, and 375 have fewer than 500 students. So you can see, we have a tremendous number of small districts, but population-wise they represent a very small proportion of the state.

Our demographics in the state are changing very, very rapidly. Interestingly enough, though, they are changing much less rapidly in the rural areas within the small school districts. Our statewide ethnic breakdown currently is about 50 percent white, 30 percent Hispanic, nine percent black, and seven percent Asian. For districts under 2500 students, the breakdown is 69 percent white, 23 percent Hispanic, three percent black, two percent Asian, and two percent Native American.

As for performance, I'll give you just a couple of contrasts for interest's sake. College-going rates are about the same in the state as a whole and in rural and small districts. The drop-out rate, though, is significantly lower in the small and rural districts. I should mention that we also have an outstanding association of small school districts which has done an awful lot of political and programmatic advocacy in the last couple of years. Bill Lucas, who works with that association, is here, and I want to acknowledge their efforts. They just completed a comprehensive survey of all of our small districts which they'll be making available. I encourage you to take a look at that.

Seven Issues Facing Rural Schools

I think the agenda of this conference is tremendous. It has touched on many things that we've been working on. I won't get into any detail on the programmatic things we're doing in California. Many of them are already on the agenda. If you want to ask questions, feel free. Meanwhile, let me touch very quickly on seven issues that we think will affect rural schools.

First: **Accountability**. I think this is kind of a sleeping-giant issue for small and rural districts. In our state alone, we have two major initiatives, one of which will require an accountability report card next year including 13 items. I've got some copies if you'd like to see it. This report card will have to be produced by every school every year. I think the implications for small school districts are tremendous in that we will need to find ways over the next five or ten years to begin tailoring our testing, assessing, and data gathering procedures so that we can get useful data out to parents without increasing an already onerous data collection burden. I think that's going to be a real challenge which we need to start working on right away.

Second: **Getting ready for growth**. The fastest growing areas in our state are rural areas which are turning into suburbs. The large cities are becoming progressively less liveable, so two things are happening. Number one, people are taking off entirely and moving someplace else. Number two, they're beginning to commute phenomenally long distances. That is to say, people are driving two and three hours a day each way from the Central Valley into the San Francisco Bay Area. The traffic congestion is so bad that you can drive from Redding to Sacramento faster than you can drive

from San Francisco to Sacramento, and the distance is a third longer to Redding. So rural communities are being jumped by developers. They're not in the least bit prepared for this growth, and I think that in the next ten years or so you'll see a lot of unlikely places turning into suburbs. I think that unless these communities really begin to plan for growth—begin preparing to pass bond issues and the like—they're going to be in real trouble when the growth hits. Developers aren't going to wait until you get the schools built.

Third: **Dealing with consolidation while maintaining the advantages of small schools**. There's a funny thing happening in our state. Two contradictory trends are kind of running into one another. One is an enormous pressure for reducing bureaucracy and administration. There's a lot of pressure to cut down on duplication, and that's creating more pressure for consolidation. On the other hand, in the larger school districts, people are beginning to figure out that smaller, more personalized environments for kids—particularly in junior highs and high schools—are a good way to address the needs of at-risk kids, potential drop-outs, and so on. So in the urban areas, they're creating schools within schools. And in rural areas, people are pressuring administrators to try and consolidate. I think it's going to be very important not to trade away the educational advantages of smaller schools and districts in favor of administrative efficiency—which may not turn out to be as valuable as the educational advantages that we've got in the first place.

Fourth: **Addressing at-risk students**. In California, we're trying to put together a comprehensive policy that addresses the needs of at-risk kids at five levels. Doing this only at the junior high and high school level is not sufficient. So we're looking at a policy strategy for ages 0-5, early elementary, later elementary, middle/junior high, and high school age. This is going to require school people to really begin working with health and social service providers in their communities, especially regarding the younger age groups. Michael Kirst and his PACE group have just done a report called *Conditions of Children in California*, and this looks at the status of children across all of these service-provided groups. I encourage you to take a look that report. It's a real eye-opener.

Fifth: **Training, training and more training.** I'm glad to see there are a lot of sessions on in-service on your agenda. This is as it should be. We are way underinvested in training compared with any sensible private business. If we were a private business, we'd be out of business because we don't train our people, either on the front-end or through in-service. In California, we have tremendous curriculum materials, new textbooks, and assessment materials. But we can't install them adequately because we don't have the wherewithall for training. I'm fond of saying that the next wave of reform won't involve new reform at all. It will simply be developing the capacity to install the reforms we've already put together. I think we know how to make schools better. But we have to teach our school people how to implement what we know.

Sixth: **Technology is absolutely crucial**. In California, technology is not only crucial to rural schools, but it's potentially a big money saver for all schools. So we're trying to encourage small districts to form partnerships with large suburban districts. We're so convinced of the potential time and money savings that we're putting together a proposal to try to put a satellite dish at every school site in the state—that's about 7,900 sites. This system would be used both for distance learning instruction and for teacher training.

Seventh: **Garnering resources in the face of hostile demography**. The political climate right now in Washington and in much of our state is pushing reform without investment—reform on the cheap, if you will. Education is everyone's number one priority until they get the bill, and I think we have to convince people that we're not going to succeed unless we make crucial investments. Things like pre-school, early childhood education, and teacher training cost money. Not only is our population aging, but we're getting growth in the minority communities. The minority communities tend not to vote—so the task becomes much tougher. I think that we have to align ourselves with business and make the economic argument that we as a society need an adequately trained work force to keep the economy in good shape. If we can make that argument, then I think we'll get the investment we need.

EUGENE PASLOV

State Superintendent, Nevada ▪

I'm always hard-pressed, especially when our legislature is in session, to attend meetings of this sort. You've heard the two previous speakers allude to the unusual features of their respective legislatures. Let me tell you that Nevada has its own variation of peculiarities when it comes to the legislature. You never know, for example, when you leave town what's going to be done to you. And you hope when you get back that what was done to you wasn't too bad.

One of the joys of being able to get here occurred this morning as I was going to breakfast. This gentleman said, "Are you Gene Paslov? You probably don't remember me, but I was in your 11th grade English class 26 years ago." I sat down and we had a very nice conversation. Isn't it wonderful that as a teacher you can show up someplace and run into a student from 26 years ago?

I want to take a minute or two and tell you about the Nevada context and about some of the policies and trends that I think are important for rural education. First of all, Nevada is 110,000 square miles—a big place, but not a lot of people. Just slightly over a million people. There are 17 county school districts and about 350 school buildings. In terms of percentages, we're the fastest growing state in the nation. That has a tremendous impact, which I'll talk a little bit about in a few minutes. But first I want to give you some feel for the contrasts we have.

Our largest school district is Clark County, better known as Las Vegas. It is the 18th largest school district in the United States and has 108,000 kids. About 120 miles to the north is Esmerelda County School District—a K-8 district with just 187 kids. The next largest school district is Washoe County, 400 miles to the north. So you can see that to go between our two largest school districts is quite a ride. We recently had a choice plan introduced to our legislature which would allow for open enrollment. I kept thinking about the transportation problem there. Since I have my private pilot's license, I thought maybe I could start the Paslov airline for kids.

But those kinds of distances are really quite significant. The longest bus ride in our rural counties is 103 or 104 miles—one way. So we have, as you can see, some real contrasts. The Nevada economy right now is wonderful. It's a growth economy, it's booming, and it is predicated on two major industries. One is gaming. The other is mining. Mining has historically had a tremendous impact on the economy. And currently there is a boom in gold and silver. Nevada is now turning into the largest gold-producing state in the world. Mining in Nevada is looking very quickly to surpass South Africa. But the gold and silver industry is volatile. Its profitability is based upon current technology and international precious metal prices, as well as on the availability of gold-producing ore.

Gold is a non-renewable resource. In other words, at some point it's going to be gone. Right now some relatively small communities in rural Nevada are experiencing 300 and 400 percent growth, with tremendous impact on the schools. Now what will happen is that this gold and precious metal boom will probably last another 15 to 20 years—experts have different opinions—and the duration depends on a lot of different features. And then it will be gone—again, with tremendous impact.

Coping with an "Accordian-Like" Economy

This accordian-like economy of growth and reduction is likely to remain in effect in Nevada for a good number of years. As a result, many changes are occurring in our rural communities. And I want to just talk about three dramatic policy consequences. Some of these David Gordon mentioned, and I think you will hear them again from other speakers. But I do think they are worth emphasizing.

First: **The school infrastructure**. By this I mean the building, the staffing, the transportation. All of these are undergoing some very dramatic changes. Elko is a prime example. Its K-12 population grew by 16 percent just last year. Now that's two relatively small elemen-

tary schools—400 students each. But it has some very dramatic consequences for the community of Elko. It means, for example, that they have added portable buildings to their elementary schools. They have entire elementary schools that are built with portable structures. In light of the inevitable bust in mining, there are cost advantages to portable schools. When mining dries up, those portables will probably have reached the end of their building life.

As part of this growth that is occurring in mining and other rural communities throughout Nevada, their problems begin to look more like suburban and urban woes. For example, we are now experiencing problems with youth gangs. When someone mentions youth gangs, you think of Los Angeles—never Elko, Nevada. Guess what, folks, Elko has youth gangs. And we're having more and more difficulty with family problems and youth problems such as suicide, teenage pregnancy, and various criminal activities. In Elko, for example, the police are dealing with a tremendous influx of folks from all over the country—and this burden has caught them by surprise.

It's interesting to see the way Nye County, another one of our rural mining communities, is dealing with the infrastructure problem. There, the community of Round Mountain is about 60 miles north of Tonopah. Tonapah is in the middle of Nevada, and although it's not the end of the world, there are those who claim you can see the end of the world from there. Round Mountain is in the middle of the desert, and Echo Bay Mining Company is mining there. I flew out to Round Mountain. It's no longer round, and it's not a mountain. It's a big hole, 700 feet deep.

Echo Bay built a new junior/senior high school in Round Mountain and gave it to the school district. It's very nice, and quite adequate for a school building. But it's probably going to last for only about 10 or 15 years. It's a pre-fabricated type structure. It will either wear out or it can be taken down in 15 or 20 years. But the mining company put it up for the local board of trustees. So we see the involvement of the business community trying to deal with these infrastructure problems.

Second: **Telecommunications**. This issue is of tremendous concern, not only for its cost-saving aspects, but for what it has to do with equity. We are generally of the view—and I think it can be substantiated empirically—that the quality of our rural schools is not adequate. Not adequate to allow the graduates to be competitive in university settings, in other post-secondary areas or in workplace settings. We've been falling far short. That is a very serious problem. Telecommunications has the potential for at least addressing this aspect of educational equity in rural communities. We have, as was mentioned earlier, been working with Far West Laboratory. The State Board of Education has put into place some new graduation requirements just within the last couple of years. One of them was in arts and humanities. We knew that our rural schools were going to have some trouble with that, so we've been working with the Lab to develop new training and materials, and also to begin looking at the telecommunications capacity to help in that.

Let me tell you what happened with one small high school of 22 students, 7th-12th grades. The local school district tried to close it down a few years ago. It was an old school that had been there for many years and the community—a very strong Mormon community—did not want it closed down. The local board and superintendent did want to close it down and transport the kids 40 miles to the larger high school. There was a battle. The legislature said, "We can solve this problem with telecommunications." And actually they did. They put some money into it.

On Monday morning before the Nevada legislature there are going to be four bills introduced that—if passed—will create a statewide telecommunications network that will establish some pilot projects. It's a hybrid system utilizing microwave, satellite communications and fiber-optics, and we've got the public utilities involved. If we can get these bills passed—and we think that we can—we will make a dramatic statement on the need for telecommunications for our schools as well as for county, local and state governments.

We are also deeply involved with public television. How can we have our public TV stations—located primarily in our two urban areas—reach out to our 15 rural areas?

Third: **Rural school financing remains an ongoing problem.** Our keynote speaker this morning talked about some of the mythology around providing services in rural communities. The myth is that it's less expensive. It clearly is not, as he pointed out. What is our ability to provide the support service, infrastructure, or staffing services? It is now very difficult for us to attract the best of our teaching force out into our rural communities and maintain them. I am convinced we're going to have to pay them substantially more money—the teachers, support staff, guidance counselors, school nurses, school psychologists. We cannot get school psychologists into our rural communities. It's very difficult. Yet

there's a tremendous need.

The Nevada system for financing schools already does address the differential cost of doing business in rural communities. But it is insufficient. We are going to have to revisit this, and it's not going to be done by this legislature. They meet only every two years. At any rate, we are going to have to revisit school financing and make a much more dramatic statement regarding the differential cost of doing business in our rural communities. I think there is real interest in doing that. And I think we will have the support of the legislature and our rural communities.

JAMES MOSS

State Superintendent, Utah ▪

Part of the challenge of batting clean-up is to see what's left. Let me share some things with you—more by way of confirmation than information—perhaps with a few additional perspectives as well. We're delighted to be here in Arizona. Ray Kellis, who is a fellow Mormon, keeps reminding me that Brigham Young was sick when he led the Mormon pioneers into Utah. He did not say, "This is the place." What he actually said—but was not heard—was, "This is a disgrace. Drive on." So we'd eventually get to Arizona one way or another. We are glad to be here.

The challenge we face in Utah, particularly in rural Utah, is very similar to that which you face in other states. We began our educational program at least for the transplants to Utah with the indigenous popluation. A 17-year-old girl named Mary Jane Dillworth gathered a group of Mormon pioneer children in a covered wagon in August of 1847 to begin the educational program. She had a large class with few resources. Utah education has not changed much since then. We continue to have interesting demographics.

You may be aware of the fact that in the last ten years Utah's student-age population increased by 45 percent. The national average showed a decline of nine percent. I think Arizona had about a 13 percent increase. Massachussetts had about a 25 percent decrease in terms of its student-age population. We're dealing in these Western states with some very large increases in population, and Utah has led the way in that for some time.

Our dependency ratio is the highest in the nation. We have the highest percentage of our population aged 0-17 of any state in the nation. We have the lowest percentage of age 18-64 of any state in the nation. That poses some real problems for us. Of course rural education has felt the impact. As Ron Knutson indicates, the problem you have in rural education is that you do have that gap—with the large families who are continuing and then the old-age population, but few people in between.

The other challenging point is that we are not a rich state. When the U.S. Department of Commerce measured the wealth production in states by the 26 most commonly utilized taxes, Utah ranked 47th or 48th in the nation in our capacity to raise money. So state resources are not great, but we continue to have a large influx of students. As a result of that, our class sizes have been among the largest in the nation. We now vie with California due to that state's Proposition 13 that brought some of the challenging problems Dave Gordon mentioned. We have the lowest expenditures per pupil of any state in the nation—or nearly the lowest—and our administrative costs are the lowest. So we are moving towards year-round education for purely economic reasons. We have a higher percentage of children in year-round education than any other state. School building in Utah has ground to a halt. We have only two buildings under construction in the entire state right now. So we are facing some interesting demographics, and we're responding to them in very positive ways. We have a number of district superintendents from rural areas who are providing some very dynamic leadership in facing those challenging juxtapositions in demographics and funding.

Four Main Challenges

There are four main challenges that I believe we will face in education in the next 15 years. First, **to increase educational productivity.** That's going to be very difficult for us to do because we already have the most cost efficient educational system in the country. We frankly are able to do some exciting things with very little money, and I believe that's due to the quality of the education force in the state, and to very dedicated parents.

A second challenge is **to maintain and improve the quality of our educational system.** We were hearing increasing calls for reform from outside the system, beginning with the *Nation at Risk* report. The demands have not let up. State governments are now getting into the act in a very aggressive way through the National Governor's Association. And the business community in America is recognizing that America is no longer competitive in the world. The reason it is no longer competitive in large part is because we are not as pro-

ductive as we once were. And lower productivity—as business people perceive it—traces to the lack of quality in education.

My perception is that it's not a lack of quality but rather the lack of the dynamic partnership which formerly had characterized the business-education relationship in this country that we must renew. And there are some exciting things happening which I'll mention briefly in just a minute in that regard.

A third major challenge for all of us is going to be **increased accountability.** That's coming in part because of increased scrutiny from the business community, and a shift from input orientations to outcome orientations as we begin focusing less and less—appropriately, I believe—on what we're putting into education, and more and more on what are we getting out of education. Dave Gordon alluded to the program which they have now coming out in California. I'll mention briefly our assessment programs in Utah as well.

And the fourth is greater **flexibility**. Futurists have spoken for the last several years about the shift from hierarchical structures to more networking structures. We're beginning to see that shift moving aggressively into the educational agenda. Examples are site-based management, the agendas of both the NEA and the AFT in terms of teacher empowerment, and the shift of authority and responsibility down to more local levels. It's going to affect all of us.

Utah's Major Changes

Now within the broad framework of those four important challenges, let me just briefly summarize some of the major changes that are happening in Utah that will affect rural education. **The first has been the impact of technology**. We have with us Dr. Kolene Granger who'll be speaking later, and one of the first things she did when she became an Associate Superintendent at our State Office was to chair a new master plan for educational technology. That has begun to guide our efforts as we looked in four major areas to try and strengthen our technology roles.

The first has been with computer-assisted instruction in the classroom. The second has been the development of instructional management—utilizing technology. The third has been the adoption of an integrated distributed data processing system in which we can access information from the districts, process it, and then turn around and provide it back to them in a variety of student learning areas, financial areas, grading, and a variety of other things. And the fourth exciting area is, of course, distance learning. And you'll be hearing much more about that.

We're happy that Dean Bradshaw, who formally was with us in the State Office in Utah, is now with Far West Laboratory. All of us are benefitting from the work the Lab is doing in distance learning programs. We see distance learning as the major salvation for rural education. A generalist teacher who may have very few students has to meet a set of state-mandated graduation requirements and use a core curriculum. That's a difficult challenge. But you can turn a generalist into a specialist when you utilize appropriate technology. You can also provide for classes which you simply don't have in the curriculum because of limited faculty slots in some rural schools. So technology will have a major impact.

The second area that I think is coming at us very quickly and will affect rural education is educational choice. It's interesting to see the shift from the Reagan administration to the Bush administration in taking out the most controversial aspect of choice education—public/private choice. But within the context of Secretary Cavazos's continued efforts to push choice, I think we're going to need to be aware that it will impact us. We have in Utah already probably one of the most extensive developments of choice in public higher education. We're very proud of the fact that Utah ranks first in the nation in our participation in the advanced placement programs, and still has a better-than-average pass rate. We're moving aggressively in concurrent enrollment, but we have yet to move into a significant interdistrict shift on the basis of choice other than to accommodate growth.

We do have extensive numbers of Utah students who have made intradistrict choices. But to have a public policy of choice is an agenda that I think is on the minds of several people in our state, and that will potentially have an impact on rural education. The concept of magnet schools, of course, is also one that we'll be looking at. We're in the process of looking at some pilots, but we have no full-blown magnet schools yet.

We do have some other things that are interesting. We have a block grant program for funding that the governor and the State Board of Education have supported. John Bennion, who is here from the Salt Lake City School District, will be speaking to you later. Salt

Lake City is one of the districts utilizing a block grant funding approach that will allow for much greater local control and local flexibility. It will be exciting to see how much of that translates into educational choice and site-based management, resulting in the empowerment of teachers and principals at a local level.

A third major change that's taking place has to do with the content of our educational system. We have developed in the last five years a major reform in Utah's core curriculum that is now being implemented throughout the state. We've increased our graduation requirements, and we have made a major shift toward both vocational education and a focus now on character education. These changes obviously are difficult to implement and even more difficult in rural settings when you have fewer teachers and fewer administrators dealing with those important areas.

A fourth major focus for us is the teaching profession itself. And I think it's no suprise to any one of us that one of the major agendas we're all going to face is who really controls the education profession in this country. That is going to be a very important policy decision that we're going to need to address in the next few years with our teachers, groups of teachers, committees of teachers as empowered individuals, the Toledo plan, or the NEA agenda—whichever you'd like—assuming greater responsibility. Principals, district superintendents, state boards and state superintendents will have less control. What's coming at us is the question of whether we'll have a shared system of governance or a battle between various parts of the education family. We need to be aware of that. It will affect how we relate to each other in rural education.

We have a course of major development in all four states dealing with career ladders and differentiated staffing, and use of volunteers. You'll be hearing more about those later in the conference.

A fifth major change that we're making involves funding issues. We've already heard several mentions of the challenge of rural and urban equity. The results you get depend upon how you define that. If you talk about population equity, then obviously you get one answer. If you get talk about program equity, you get a very different answer. We've just commissioned in Utah a major school finance study that, after 18 years, has the potential to significantly revise our school funding formula. One of those issues that we're going to have to confront is how we can be sure that we provide equitable funding for rural schools.

The sixth major focus concerns how we deal with students. We have been excited at what's been happening in California, Arizona and Nevada in at-risk youth programs. We are doing the same in Utah. The business community is driving this very aggressively because they want to ensure that all students come out of the educational system with marketable skills. As we have addressed at-risk youth with the Council of Chief State School Officers and other major national groups, we have found the focus increasingly moving toward early childhood education.

Interestingly, some states have very conservative attitudes toward early childhood education. I don't know that California shares that as much. But we certainly have that in Arizona, Nevada, Utah, Idaho, and the Rocky Mountain states—a very conservative attitude in dealing with early childhood education. That will be the case in our rural areas perhaps more than the urban areas. But early childhood education is an agenda that we have to confront, as the research very clearly indicates. We need better prevention programs and less emphasis on remediation later. It's more cost efficient and more successful to deal with it earlier. So we'll see an increase in early childhood programming.

The learning process itself is being changed rather dramatically in Utah with Outcome-Based Education in many of our rural districts. We have a major assessment program to respond to the call for accountability with district report cards, norm-referenced testing continuing in each of our districts, a criterion-referenced testing program that is tied to our core curriculum, and of course some basic statewide skills testing that we have about every three years.

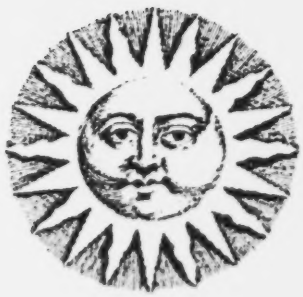
The last thing that I'd like to mention is a major agenda—the growing need for the business-education partnerships in this country. The California compact that Bill Honig and others worked very aggressively to develop about a year ago with the California Roundtable and Business Alliance has been duplicated in some ways in Utah. The governor just announced a month ago a major effort on the part of the state Board of Regents and the Board of Education for the Utah partnership for education and economic development that will bring business closer together with education to stimulate economic development and strengthen education.

The problem for rural education in Utah is that the major corporations are all pretty much located in the urban centers. As we look towards those business-

education partnerships, the challenge will be to ensure that they reach out to affect rural education as well as urban education.

Rural America is changing dramatically and I think we have to recognize that. When I lived in Long Beach in California, I remember going once to El Dorado Park and seeing this beautiful playground and a little space designated off to the side. It looked just exactly like my backyard in Utah as I was growing up and I looked over and it said, "Wilderness Area." I thought to myself, what's one man's backyard in Utah is somebody else's wilderness area in Long Beach, California. Things are changing, and we have to recognize that what was rural America ten years ago is not rural America today.

Finally it is critical for us to recognize that in the next two years we're going to have a census. We're going to have redistricting once again in this country, and there have been some fairly dynamic shifts. I'm already seeing jockeying for the realignment of congressional districts. We are in danger of having a major loss of political power in rural America in the next three years. My feeling would be that it's essential for rural leadership to band together and maintain its influence during that time of political change.



RURAL SCHOOLS AND RURAL DEVELOPMENT: POLICY IMPLICATIONS ▪

▪ ***Ron Knutson*** *is a professor and extension economist in agriculture and rural development policy at Texas A&M University. He has served as chief economist in the Agricultural Marketing Service of the USDA and in leadership positions on several national commissions. He has authored over 300 publications and is especially known for his college textbook and numerous articles on family farm survival and the impact of government programs. His most recent work involves the development of several policy options for addressing rural community and development issues.*

What are we doing to improve our rural policy and its impact on rural schools? It's my view—and you will see why, as I go through the results of our work over the past two years—that rural schools are a tremendously important key to changing our national policy with respect to rural America. And what we need to change isn't just our rural policy. We need to change the whole picture of how we do things and how schools relate to rural communities. I hope today to give you a feel for our views on that issue—and when I say "our" views, I'm talking basically about the results of four workshops that were held about a year ago in Syracuse, Birmingham, Minneapolis and Reno, and in which over 700 individuals participated.

I've titled this talk *Comprehensive Rural Development Policy—The Rural Education Component*. And the rural education component is in fact probably the most important component of rural policy. I want to talk some about what rural development is. Then I want to look at some of the demographics—at the status of rural policy and the effects that I see on rural schools. I also want to look at the concept of a comprehensive rural development policy that came out of our workshops and the role of rural schools in that policy. And then I'm going to back off a little bit, realizing that if we're going to do something about federal policy, we're going to have to influence the actors—the people who make policy. So I'm going to talk briefly about the change in actors that's taking place in Washington now. And then I'll end up with some brief comments on the prospects for rural development policy as I see them.

What Is Rural Development?

Rural development is a relatively simple concept. It means the largely public but also private efforts to influence economic growth and the level of living in rural areas. It means policy initiatives at any level—local, regional, state or national. Most of our rural education policies are at the local and state levels; only about six percent of our rural education funds come from the federal government. The big role that I see for the federal level is leadership. I don't think we're going to get a whole lot of extra federal money. But the previous administration had a very negative attitude toward rural schools—maybe toward all schools. We hope now to see that attitude changing. And we hope that the attitude toward rural development is changing as well.

Let's look a little bit at the demographics. The situation in rural America is not good. More important, it's not improving. Even though the rest of the economy is looking a lot better, the rural economy is not. I see this as a product of many years wherein we've neglected rural education and rural health. Rural unemployment is a third higher than urban. Historically, urban unemployment was always higher, but that changed in the 1980s. And now I think we're going to have a very difficult time turning it back.

Rural income is a fourth lower than urban. Rural poverty is a third higher. You people here are certainly aware of the poverty problems that we have on the Indian reservations. Yet I would guess that most of the people in this audience think that the incidence of poverty is highest in inner cities. It's not. It's highest in rural areas. We have a higher dropout rate in rural schools. As as a result, we have a lower level of education completion in rural schools. And one of the most vexing things about the problem is that demographically, we have a bimodal distribution of the population. We have a lot of old people and a lot of young people.

What does that do to rural schools? Look what happens when you put up a school bond issue in that kind of environment. The preferences of the old people who vote are different from those of parents who will vote for higher appropriations for schools. The older population will tend to vote more for security and health programs and vote down the school bonds. We've begun to realize that when the general economy improves, the rural economy doesn't. It's a very, very difficult problem. And there's going to have to be a change in national policy to solve it.

We can divide the problem into three parts. One is a human capacity component—health and education. A second is an infrastructure component—roads, bridges, water treatment systems, school buildings, telecommunications systems. And third, there is a financing or taxation component—how do you get the money to do these things? How do we finance it at the local, state, federal levels?

At our four workshops we spent a tremendous amount of time in roundtable discussion, trying to get people to prioritize the issues facing rural America. We sent out a survey in advance, and the most important issue identified in that survey was income and employment. But at the workshop, the most important issue turned out to be education. Not agriculture, not public lands, not water quality, not jobs—but education. If you look at it regionally, education turned out to be the most important issue in the Northeast and in the South. In the West it was the second most important issue. So education ranked high in all areas. And if you add it up, it ranked highest as a rural problem.

To me, that is a very important finding because there are a lot of leaders in rural America who don't appreciate the fact that we've got problems in rural schools. About six months ago I spoke at an agricultural roundtable meeting in Chicago that included the chief executives of the largest agribusiness firms in the country—John Deere, Monsanto, Nabisco, General Foods, and so forth. There were two former Secretaries of Agriculture in the audience. I made my point about the problems of rural schools. And one of the agriculture secretaries—who shall go unnamed—said he doesn't believe it. He said, "Look at me. I was educated in a rural school, and I rose to be Secretary of Agriculture." I was tempted to say, "Exactly, that's part of the problem."

But the point is that we have a lot of leaders out there thinking that because they were successful, rural schools must be of good quality. And that's something we have to overcome, because leaders have a lot of influence on policy outcome and on the amount of attention given to the problems.

The Status of Rural Policy

Whether you like it or not, rural policy is established by agriculture committees—not by the education committees or health committees. There's a myth in the agriculture committees that the best rural policy is a strong farm policy. But I hope that the record of the past eight years—where we spent an average of $20 billion a year on farm programs, yet the rural areas continue to go down—demonstrates to these people that this idea is, pure and simple, a myth. It's the first thing we've got to overcome.

Secondly, there are very few targeted rural programs. Bascially, we have national programs. Who runs them? Most of the people who are elected or appointed to positions in Washington come from metropolitan areas. Most of the people live in metropolitan areas. So when you have a national program, its design tends to be targeted on where most of the people are. And the problems in rural schools, rural health, and rural water treatment are significantly different from those in urban schools. Yet our national programs are oriented toward the urban problems. My view is that we don't need to spend a whole lot more money on these programs. What we need to do is target them to solve rural problems. The only money I know of that's specifically targeted toward rural schools is the $6 million that the Labs receive. That's $20 billion on rural programs versus $6 million on rural schools—nobody even notices it except the Labs.

There's a myth that it costs less to provide rural services than urban. We've all heard about the Medicare/Medicaid issue where some bureaucrat apparently did a study and found out that it costs less to provide rural medical services than urban. Therefore, we set up a structure of aid where we pay less for medical care for the elderly if they're in rural hospitals than we would if they're in urban hospitals. Now if you don't consider the quality of the service, then of course it costs less to provide medical care in rural areas. You don't have the specialists. You don't have the complex equipment. So we set up a system that predestined the failure of rural hospitals. And you could almost argue the same for rural schools.

No doubt it costs more to attract good quality teachers to live in rural areas instead of urban or subur-

ban areas. Sure you've got some committed people who want to teach in rural schools. But by and large, you can't attract the highest quality teachers. So inherently it costs more. Rural schools only cost less if you don't consider the quality factor. And do we have any good studies that really look at what the comparative costs are between rural and urban schools if we were indeed to provide equal quality in education? That's research that we badly need. For the same quality, what does it cost? Who benefits? Why is it that we don't invest as much in rural schools?

A mayor got up at one of our planning sessions and said, "I don't really think we want to invest any more money in rural education because the people that we train will simply move away, and then they won't be available for our local factories." That mentality is unfortunate. It fails to recognize that future jobs will require higher skills and thus higher levels of education. It's true that if you train people well, they may move out—maybe even out of the state. But this doesn't mean don't educate them. It means that while we once considered education to be a local responsibility for local funding, and now we look on it as a local/state responsibility, we could also say it is a local/state/federal responsibility. And we're not spending nearly enough money at the federal level on education.

That's not going to be a very well received message in Washington, considering the big budget problem. But the bottom line is that basically we have no rural policy.

What all this means for rural schools is, first of all, the rural demographics create the need—you've got a large proportion of young people, but it detracts from the political support because you've also got a large proportion of old people. Secondly, selective outmigration makes funding for education increasingly difficult. If the best people continuously move out, you have more and more problems in the long run.

Need for a Comprehensive Rural Policy

We need to divide the problem into its three parts. One is social infrastructure—capacity building. Second is physical infrastructure. And third is business development. And what we're talking about here is needed redirection of programs. Sure we need more money, but we probably aren't going to get it. So how are we going to redirect our programs?

For **social infrastructure**, we need first of all to eliminate the rural health inequities. You have a higher proporation of old people, so you're going to have greater health needs. And yet we've got hospitals going belly-up.

Secondly, we've got to **eliminate the inequities in school financing**. And it's my view that while the pressure is now on the states to do that, through court decisions and the like, I think an argument can effectively be made that over time the pressure is going to move toward the federal level, particularly for financing rural schools.

Third, the **problem of illiteracy**. I'm interested in this one because it was a big election campaign issue, but I've heard absolutely nothing since the election about any initiative with respect to illiteracy.

Fourth, in several of the regions, the problem was identified as a **lack of leadership**. And it was identified not in the sense that we don't have political leaders. We do. But we don't have knowledgeable political leaders. Now whether it's true that you can't train leaders, I don't know. I hope we can, at least over the long run. But there's no doubt that selective outmigration has taken its toll in terms of rural informed leadership.

As for physical infrastructure, certain things may not seem to have much education meaning, but actually they have a whole lot. You can't employ an effective distance learning system in rural schools, for example, unless you have a modern telecommunications system. And so one of the things we're going to have to do is support initiatives in the telecommunications area. And we need rural health delivery systems—emergency medical services in all rural areas. For some of these things you don't really need to have big federal investments. If you can provide the private incentives in, say, telecommunications, you can accomplish a lot.

And then there are needs in business development: Technical assistance, management training and business services. We have very few business schools that teach rural or even small business management. At the University of Texas, their concept of a small business is compact computers. My concept of a small business is a hardware store out in Muleshoe, Texas that has to compete against a Wallmart, which is a big business. There's nothing that will kill a rural retail structure faster than the arrival of a Wallmart store. Yet many rural communities will compete for a Wallmart store. You can't live without them, but you can't live with them.

The Role of Rural Schools in a Comprehensive Policy

What is the role of rural schools in a comprehensive rural policy? Well first of all, good schools make a community an attractive place to live. What's the first thing a business looks at when it thinks about whether it can get people to live in an area? It's the quality of the schools and the doctors.

Secondly, an educated labor force is a flexible labor force. So it's obvious that if the quality of rural education declines, we're going to need more job training. Keep the quality of education high and you won't need as much job training because the people will be flexible. One thing we must do is create an environment that discourages selective outmigration. Can you create rural communities that people want to go back to? So that after they go to a good university like Texas A&M, they say, "I want to go back and work in Muleshoe"—not in Houston or Dallas or Austin?

And third, the ability to deal with the short-run problems as well as the long-run issue. The long-run issue is rural education. But we've got a whole bunch of short-run problems like illiteracy and job training.

Future Prospects

I think we're beginning to get a recognition of rural problems. And I even think there are a few people now who are beginning to recognize that rural problems and the farm problem are not synonymous. Not many. But a few.

Budget constraints are going to limit large scale initiatives. We might be able to do some targeting and create some private incentives. But we aren't going to spend huge amounts of money for the forseeable future. That's one of the reasons why it's so agonizing to attack the rural health problem. Equity requires $6 billion. Where are you going to get it from? Rural telecommunications have about the same price tag—that's why you look to private incentives.

There is increasing recognition of the need for capacity building. When we got into this project, all of the talk was on infrastructure. Now we're hearing more and more about building human capacity. That means a lot of potential for targeting programs for rural schools.

The final point is that it's going to require an omnibus approach. Traditionally, rural development initiatives come from the agriculture committees—the House and the Senate. There is an initiative occurring on the Senate side to have an approach that cuts across a number of committee areas, including education, health, and small business. To the extent that you have contact with legislators, you ought to know something about this.

I have here a list of senators who have signed onto the omnibus approach. A few of them are members of both the agriculture committee and also the education committee. There's Harkin from Iowa, Durenberger from Minnesota, and Cochran from Mississippi. That's a useful piece of information.

When you turn to the House side, you find that they don't have an omnibus approach going yet. So you look to the agriculture committee. Its chairman is de la Garza from Texas. English from Oklahoma is chairman of the subcommittee on rural development. On that committee are Jontz from Indiana and Grady from Iowa who are also associated with the education committees.

The attitude in Washington toward rural schools appears to have improved. Under the previous administration, when I contacted the Department of Education and told them what we were up to, the response was, "Is there any way we can put a stop to this?" It was a very negative attitude. They contended that rural education is not a part of rural development and has no place in rural development. They did not want to see a rural education initiative. I think the Labs' experience in fighting for its appropriations in rural development reflects that kind of attitude.

But now the president has appointed a task force on rural development. So I am excited about the possibilities. For the first time in a long time I think we're getting a correct focus on the rural development issue—a human capacity focus. We're not thinking about roads and bridges and sewer systems, and so forth. We're thinking about how do we help people.

Much work remains to be accomplished. All we can do at the universities is focus attention. We can't get into the trenches politically. Somebody is going to have to pick up the ball. Since rural education ends up so high on this agenda, as I see it, it's going to have to come from people like you—from our school boards, teachers, superintendents, principals. If you want to deal with the problem, it's high on the agenda of needs. The question is, do you put it high enough on your priority list to get politically involved?

RESTRUCTURING: PROSPECTS AND PROBLEMS IN RURAL SCHOOLS ▪

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I'm going to talk about three things with you today. The first is the current political and social scene and the political dynamics of education policy. The second is where we've come from in the so-called first wave of educational reform. And the third is where we're attempting to go with reform. And I have some skepticism about whether there will be a second wave of reform or whether we're stuck on a flat beach with not many waves rolling.

The Current Political and Social Debate

It's been five years, almost six, since the *Nation At Risk* report. If you look at the political situation facing education, you see that even though we've done a lot of things since then, there's still a steady drumbeat of criticism about the quality of American education. Hardly a month goes by without some report coming out claiming that the American population—particularly its children—is illiterate.

Last fall, the National Geographic Society opened up with a survey of what kids know about geography and proclaimed that they've found the lost generation. These kids don't know where they are. They cannot locate Chicago or Miami on a map or name a country that borders the Pacific Ocean. They're hopeless in the Middle East. That was followed up by reports proclaiming them mathematically and scientifically illiterate, particularly compared with other countries. I think we topped Thailand and Botswana on some tests, and occasionally we beat Ontario, Canada. The most recent survey proclaimed that we were economically illiterate. That is very much in the news.

So the general view is that whatever has happened in education has fallen far short of the mark. And indeed the criticism continues at a very intense pace in the media. The issue of education continues to defy the political cycle theory—that the American public gets bored with any issue after three years. Education continues to be featured in headline stories. Compounding this is the labor shortage. In some areas we have very low unemployment. We're beginning to draw from a decreasing labor pool of qualified people. And that is really getting businesses quite upset, so they too are escalating their critical rhetoric. The future labor force looks like it will consist of groups not historically strong in educational achievement. And growth and changing demography are exacerbating that picture.

All of this is taking place in a period when education continues to be good politics rhetorically. But we're not seeing the kinds of funding increases that we saw in the first three to four years after the *Nation At Risk* report. Studies have found that education expenditures nationally from 1983-87 increased 17 percent faster than inflation. That was the bull market. You've seen the best, I would guess, for a while. Now expenditures are beginning to scale down. And a lot of the state governments are in difficult fiscal condition. Every state at this conference, except Nevada, is facing a slow-growth revenue picture.

So we enter a dangerous period. Expectations for educational achievement and public discontent are rising. There's a call for even more drastic reforms—a feeling that what we've done is merely fiddle around the edges. My concern is that if education looks resistant to "bold new ideas" like restructuring, then once again educational leadership will take a pasting in the press and suffer further loss of public confidence.

A lot of studies tend to show that educational leadership is out of step with the general public. For example, in national polls somewhere around 70 per-

cent of the general public favors more choice in education. However, in a poll taken two months ago only one-third of school board members want parents to select the schools that their children attend. So we have the public's discontent and call for reform, the slowing down of expenditures at least in terms of state aid increases and possibly too of the local property tax, and a sense of a new Bill Bennett type scenario: "Somebody hijacked educational reform," as he put it, and it was those bad old educators again—teachers, superintendents and school board members.

I think we're entering a period where standstill policies are not good enough. And this conference is very well timed to address that.

Where We've Come From in the First Wave of Reform

I would call the first wave of educational reform, in strategic terms, intensification. You take the existing model of education and you say that it's all right—we just need to intensify it. Don't change it drastically, just do more of it. When I asked one rural legislator in California what he wanted out of our reforms there, he said, "I just want to make the little buggers work harder."

Well, there is evidence that he has gotten his wish. As far as we can tell, homework is up somewhat. High school graduation standards have changed. Kids are now taking about a course and a half more of math and science, and about a course less of vocational education. Some of the middle track students who are going on to college are facing much more difficult college entrance requirements. We've tended to centralize the curriculum at the state and district level in order to upgrade it into the higher order skills.

We're doing just a whale of a lot more testing. I'm not sure what we do with all this data. I've been trying to find out what they do with it all here in Arizona where they're testing like mad. The legislature feels good about that, I guess. We are working on better indicator programs. And generally speaking, we have upgraded the system in terms of its requirements. We've also spent more money. And we've increased teacher salaries across the country and in most of these western states faster than the inflation rate. Teachers in California now have the purchasing power they had in 1972. When you look at teachers' salaries they sort of lost ground relative to inflation and other similar professions. Then from 1972 on, they've come back and made up that ground.

We have accomplished, then, what I would call incremental intensification of the existing model of education. But I have always contended that if we were to do a report card on education reform after 1983, instead of using Ted Sizer's views or Ernie Boyer's or Bill Bennett's, we probably ought to look at the list in *A Nation At Risk*. If you look at that list, there's been movement on all of it—except anything that called for significant change in the structure of schooling.

Look at year-round schools, for instance. They have not caught on appreciably other than in places like California and Utah where year-round schooling was absolutely forced down their throats by rapid growth. But historically, as soon as growth tails off, year-round schools go away. There's certainly no national movement towards year-round schools, though this was one of the things called for in *A Nation At Risk*.

The other thing we haven't acted on in a massive way is the so-called career ladder issue. Utah and Arizona both have programs, but nationally, career ladders have not taken root. What we're seeing in Arizona is typical—a pilot program with a lot of uncertainty about whether it's going to spread.

Changes That Last and Changes That Don't

Now let's look ahead and talk about where we might go—and what the implications are for rural schools. Before I do that—and as we sort out all of these grand things that the state superintendents said today that they are working on—I think we need to take a look at the history of educational reform and do a sort of barnyard analysis.

Which types of reform tend to leave a lasting deposit? And which types of reform tend to go into a Bermuda Triangle, only to come back out again? The feeling I had when I heard all these talks about telecommunication was what that eminent philosopher Yogi Berra called *"deja vu* all over again". When I came into this business they told me that the hottest thing in rural areas was a balloon over the midwest that was going to pipe educational television down. And I heard an eminent group of state superintendents from the midwest say that this was going to change rural education. Darned if I can find it out there now.

So let's step back and look at all this. David Tyack and I studied 75 years of educational reforms. We

made a list in two columns—on the right side, reforms that lasted; on the left side, reforms that come in and out. Differentiated staffing, for instance, came back—as career ladders. Merit pay is one that will always go round and round.

On the list of things that have lasted is everything from the Carnegie unit—which some of us would like to get rid of—to vocational education, teacher aids, education of the handicapped, and school consolidation. Those things, I think, are there and in place.

But there is a long list of things that don't last. Among those have been anything that has attempted to change the basic pedagogy in the classroom. As far as I can tell, the last major change in pedagogy we had was when we unbolted the desks from the floor. And that was probably in the 1930s. All of the reforms made to introduce technology into the classroom—radio, broadcast television, and more recently even microcomputers—have failed to take root. We in education have been very successful in resisting technology. I think the burden is on the technologists to prove that a new era is dawning.

Other things that have not lasted are new math, flexible scheduling, and something school administrators will remember called program planning budgeting systems or PPBS's.

Things that last tend to have three characteristics. First, they tend to be structural or organizational accretions. You add something to the existing structure such as vocational education, school lunch, or guidance counselors, but you don't disturb the base. The way you handle technology is, you don't change the classroom structure in any way, but you tack on a lab. You hire a technician and send the kids down to the lab. The kids learn how to use the computer—usually they learn outmoded programming languages. The parents are happy, and the structure goes on—buffered and unchanged.

Second, reforms that last are those that are easily monitored. In other words, you know whether you have them or not. That was one of the problems with individualized instruction systems. You never knew what they were doing behind the classroom door.

And third—but most important—reforms that last have to build a political constituency of some sort in order to be preserved. The constituency turned negative on new math. The same happened with flexible scheduling—parents saw kids sitting outside of their school during their flexible schedules, and that did it. There has never been a strong teacher-based contituency for technology. We do use overheads and things of that sort. But where is the bottom-up constituency for the kind of grand telecommunications schemes I heard outlined today? Can these happen from the top down, from the state capitols in Carson City or Phoenix?

The Rural Future: Intensification and Restructuring

With that in mind, let's come back to the criteria for reforms that last. Let's look at them in the rural school political context and talk about them. The first kind of strategy that we can look forward to would be more intensification. Again, don't change the basic structure or the basic pedagogy, but do it better.

Make the tests better, for one thing. Arizona is talking about junking its current test which is the Iowa Test of Basic Skills and coming in with a criterion-referenced test which better matches their curriculum. And we could do a lot more staff development. California has some very good curriculum ideas but very little money to provide staff development so that teachers can use these ideas. And we could do more with the way we're teaching math and science. Something is fundamentally wrong there. The science books look like glossaries or dictionaries. Kids are memorizing terms. We could do fairly simple things like have more teacher induction, as is being done in rural schools in California, or provide some kind of help for the first-year teacher.

So I think there's something to be gained by more intensification. But since most of the rhetoric calls for moving on to bolder ways, let's move on to restructuring.

Restructuring is one of those words that means everything and nothing. In fact, in an article I use in my classes on politics, a Florida legislator is quoted as saying, "When you don't know what to call something, call it restructuring because it sounds good, and that will help you politically."

I'm going to break restructuring down to three types: The first type is restructuring which primarily focuses around either teacher professionalism, teacher participation or revamping the structure of the schools. The second type of restructuring would be a choice system. And the third kind would be schools as the hub of a comprehensive children's services system. Besides education, a problem in rural areas is health. This addresses the role of the school in delivering health and early childhood development services.

Upgrading the Teaching Profession

Okay, let's go back to the first type which is professionalization and changing the internal structure. It's well that we think about the rural aspect of this. Because most of the examples—maybe 95 percent of them—are from big city schools. These are largely American Federation of Teachers' locals, and the AFT is primarily leveraged into the big cities. The usual suspects mentioned are Rochester (New York), Dade County (Florida), Hammond (Indiana), Toledo (Ohio), Santa Fe (New Mexico), and San Diego (California). I wouldn't call any of those places obviously rural.

The whole orientation of restructuring and its policy and research discussions have been around big city schools. They talk about things that don't have much application to most rural areas. For example, they talk about decentralization so that the individual school becomes the locus of decision-making. Well, most schools in rural areas don't have a huge central office. They may only have one school. I mean, the whole talk of decentralizing the Chicago schools doesn't have a lot to do with Potter Valley, California. So that's a problem.

Another thing they talk about is the need to have smaller schools. A lot of the schools are too big. We need to have schools within schools. We need to have teachers form what they call charter schools where teachers would take over part of a school and run it more the way they want—again, that doesn't apply that much to rural areas.

However, one thing that does apply to rural schools is a change in teacher participation in rethinking labor relations in education. From the teacher's standpoint, the basic idea behind this is that we've gotten most of what we're going to get out of the traditional way of nego..tiing more and more into a contract. If we're really going to move ahead on staff development, curriculum development, or rethinking the school structure, probably the wrong place to do that is in an annual negotiation which is then put into great detail in a bargaining agreement.

So we're talking about more flexible types of collective bargaining. In California we call these policy trust agreements. We have ten districts experimenting with these. Some of them are small. The idea is that the teachers and the administrators get together and work on things collaboratively. The key word is trust. They agree to do something like develop a new staff development program or work out a new English curriculum. And they do this in a collaborative fashion, changing the dynamic of labor relations. They may include it in a memorandum of understanding. Or they may just agree verbally on it. People have said, where are the policy trust agreements, I want to see them all written up. But it's a different kind of process.

Now obviously the rural labor relations base is much different from Los Angeles, for example. But we need to think more about how these ideas might fit into it. It seems to me that this kind of thing has obvious applications to smaller areas where there is a more intimate setting.

Another angle of this—and one that would tie in with policy trust agreements—is the increased use of teachers to evaluate other teachers. In other words, peer evaluation. Peer evaluation of beginning teachers is the easiest area. Longer run would be peer evaluation of experienced teachers, and peer help for teachers who are really having problems. Toledo, of course, has a very active program wherein other teachers take on the real basket cases and work with them over a number of years rather than having the administration do it. If teachers also have more of a role in setting policy for personnel relations, that would change the way we're currently doing business. It would upgrade the profession of teaching.

Obviously the career ladder idea is another restructuring area. And the main problem career ladders have run into, as far as I can see, is that we've confused the idea of career ladder with merit pay. The two have been merged together in people's minds. While there is a constituency for some aspects of the career ladder idea—you get paid more for doing a different type of work as you move up in the career structure—there's also a negative constituency among teacher unions for merit pay.

In order to look at these professionalization changes, go back to the reforms that last. Ask yourself: Is there a constituency in your local district for these kinds of professionalization reforms? Or are the teacher organizations stuck in the we-them collective bargaining industrial union model, which is essentially what we adopted wholesale in education and brought into the rural districts as well. If you want to restructure and get your district on the list of restructured hallmark districts, you need leadership to create this kind of constituency.

If you do anything like this, there will be thousands of experts descending upon you to pull your experiment up by its roots to see if it's growing. People

are just mad to go out and find these restructured schools. If you've got any, let me know. I have numerous visitors who will buy plane tickets to wherever the hell you are to come look. And that, I think, indicates a little bit about where we are.

Changing the School Day and School Year

Now, another part of this is the restructuring of the school day and school year. In the high schools, people are asking themselves, "Did Moses hand down the 50-minute period?" The Carnegie unit has a constituency—it's a powerful constituency called the state universities. So to bust up the Carnegie unit, we have to take them on. We're finding that in science, for example, we're teaching some teachers to do better instruction through laboratory and hands-on work. But by the time the kids set up the experiment, the period's over. The bell rings, and out they shuffle, on to the next class. There's something's wrong with that structure. So we're rethinking longer and shorter periods.

Sizer is calling for much more interdisciplinary work, much more merging of curricula around communications skills, and scientific and technical skills—breaking down the subject matter areas that we have traditionally had. Do physics and chemistry have to be separate courses, or could we blend them together into a new style of course that might appeal to everybody? Is it forever that we form separate courses for biology, physics and chemistry? Is there some way to weave these together to express more general principles? Then the question comes, where's the constituency? Do the biology teachers want to be interdisciplinary? These are not easy questions. But developing a consituency is going to be important.

The other aspect of restructuring that we've heard so much about is the heavy use of technology of various types. My view of the way to get this is the reverse of what we've always done, which is to first build the exotic system and hope people will use it. The history of reform would say you build demand from the bottom up—get people saying we really want this—and then you gradually phase it in and put it on-line.

Choice

Why is choice a hot topic now? Every now and then these reforms come zooming out of the Bermuda Triangle to hit the front page of the newspaper. I wrote a paper in July 1988 saying I really saw choice on the back burner, not on the front burner. Wow! By October I was completely wrong, and the president, of course, ran a conference on choice.

There are two basic reasons why choice is moving now politically. One is that its advocates have finally conceded that in the short-run they cannot get aid to private schools. They have stepped back with a new strategy: you gradually phase choice in through the public schools and then later get to Nirvana—aid to the private schools. But you'll notice that the key thing making choice acceptable is that we no longer talk about giving any money to those dreaded entities, the Catholic schools. We only talk about choice within the public schools—Bush was very clear on that. And we don't mention the word *vouchers*, or *tuition tax credits*. Those are passe, defeated.

Choice has picked up a whole bunch of allies in the Democratic Party. The sponsor of choice in Minnesota comes from the Democratic Farmer Labor Party—hardly a right wing organization. It spawned Hubert Humphrey, Eugene McCarthy and Walter Mondale. All of a sudden choice has become bi-partisan because it's in the public sector only.

The second reason why choice is moving now is because it's the easiest way for a politician to have a big program without spending much money—or any money at all. California's superintendent, Bill Honig, has a choice bill. He says in his bill analysis that there are no costs. It's great. You get on the front page—no cost. At a time when your budgets are in trouble, that's too irresistable for most politicians. How do you do it without cost? Well, you don't pay for transportation. You just pass a simple state law that says a child can go to any school within the district or outside the district. Presto! You have a statute, you have a program, you have front page, and you've done very little that costs anything.

But the political outlook is not clear. Minnesota passed it. And then Arkansas and Iowa immediately passed it. Theirs are open enrollment bills. And some of the states put in racial or ethnic balance requirements. Choice has been defeated in Arizona and Colorado, at least for the short-run. In other states, it's pending. I don't think it'll pass in California this year.

If it does happen, what effect will choice have on the rural area? The impact could be great or small or not much. My guess is, it will be not much. If you only have one school and the next one is 100 miles away, there's not a whole lot of choice. And I don't think our

friends in the legislatures are willing to pay for the transport. On the other hand, if there are rural schools that are reasonably close to each other, then it might have a significant impact.

If you talk with some of the people in Minnesota and Arkansas—over cocktails, not overtly—they will say that the main impact they hope choice will have is to close down some of the small districts, which they couldn't do through school consolidation. If you can get even a marginal number of students to leave some of these rural schools to go somewhere else—particularly at the high school level where a larger, more robust curriculum will be offered—you can starve these schools out. Then you don't have to go through the legislatures and try to close them down directly. So you want to look out for that one. It's interesting.

My own view is that if all of these choice bills passed, they would affect probably two to three percent of the total students in the U.S. The constituency for choice is growing. It's a structural change like consolidation. It could be implemented. And you definitely know whether you have it or not—you know whether students are moving. So it would fit the criteria for reforms that last—if the constituency is built. Teacher organizations and generally the school people are wary of it. It's being pushed by business groups and parental groups in some cases, although not so much the PTA. Where that political balance comes out between those two forces will determine choice.

Schools As the Hub of Comprehensive Children's Services

The schools can't do it all. The problems facing the schools in rural America are largely problems concerning health, family, child abuse, and early childhood education. A little bit of remedial reading and one and a half more science and math courses are not going to have a huge impact on these. We need to rethink what schools do and consider an alliance of schools with other social agencies.

This comes from an analysis of a worsening conditions. There are many children with multiple needs. Services are fragmented. In my big study on the conditions of children in California, the child looks like a pinball, bounced from agency to agency. The only agency that has any data on the impacts on these kids is the schools. The schools are the only agency held accountable. Social services have case files, but they don't know where the kids went or what happened, in most cases. There's very little follow-up. Schools are exemplary in accountability, but yet we're highly criticized for our lack of it. So we could do more.

What's the role of the school in a rural area? That's a fairly complex item. It's clearer in some urban areas where you could take a lot of the city or county services, locate them at a school site, and put an administrator there to head a sort of comprehensive program of school services. But if the county government is hundreds of miles from the school, how do you link the school and county services? I think that's a difficult problem. And what are the relationships between school people and county service providers for children? Usually they're not very close. As one person in California said, when you get the social welfare and juvenile justice services together with the schools, you're talking about unnatural acts committed by unconsenting adults.

So we have a lot of work to do. Obviously, early childhood programs such as more pre-school and after-school childcare are important. How to pay for those is another question.

The rural application is made more difficult by distance. But on the other hand, some of the school/county people know each other better. One of my favorite stories on this is about San Diego's superintendent Tom Payzant—in my judgment one of the best in the country. He came from Oklahoma City to San Diego, and after five years he still had not met anybody in children's services or children's welfare in San Diego county government. Finally, he lost a school-based health clinic in a close board vote. The guy from children's health services called him up and said, "You know, maybe we ought to meet. I could have helped you with that if I'd only known who you were."

We have to overcome this. I think it's very important to have interaction in rural areas between child abuse services and education services.

Needed: Constituencies and Funding

I don't think we're going to get away from demands to do more beyond intensification. One difficulty will be how to build constituencies for all of these changes, because we are pretty set in our ways and change is hard. And the other will be how to finance these kinds of changes to the extent of taking at least planning money and free resources to begin some kinds

of work on either school district restructuring or teacher restructuring—all of this taking place as state aid is slowing down.

So I would urge you as you go forward with this to think about these ideas in terms of your context. Because the one thing we've learned about all of these reforms is that they're tailored to the particular state and local context. There is no way that you can take them from one place to another in cookie-cutter fashion. And I think that's what you're all about at this conference.

TRANSFORMING THE TEACHING PROFESSION ▪

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The title of my presentation is "Transforming the Teaching Profession." What I'm really talking about is the role of research in that transformation. You all know that you go to universities and learn the world of research. Then you go into the world of practice. And then you have to stop and say, "What did they teach me there, what am I doing here, why is there a chasm between the two?" There are two communities, and there is a chasm. But I think that's changing.

In order to understand a little bit about our profession, we have to go back in history and try to understand the nature of professions in general. About 120 years ago there were three equally disreputable professions—medicine, law, and education. Doctors and hospitals were the people and places associated with pain and death. Only a few returned from medical treatment healthy, happy, and convinced that the medical profession was distinguishable from the local blacksmith or the visiting healer or snake-oil salesman.

The true state of medical ignorance has recently been uncovered. Just take these statistics—during the Civil War, among the Union troops, penetrating chest wounds incurred a 62 percent mortality rate and abdominal wounds carried an 87 percent death rate. By contrast during World War II, which is not yet the modern era of medicine, only about three percent of injured American soldiers failed to survive. In the 80 years between the Civil War and the Second World War, incredible advances had taken place. Doctors during the Civil War, 120 years ago, believed that pus was part of the natural healing process. Thus infected wounds were rampant. Physicians themselves propogated many infections by probing wounds with fingers wiped on pus-stained aprons and towels. The importance of clean hands and sterilized equipment was simply not understood. Maggots were the most effective infection fighters; they infested the wounds and ate only the diseased tissue, leaving behind the healthy part of the wound to heal.

So the profession we revere today, 120 years ago was causing harm, spreading disease. Although well-known and often used in Europe, thermometers, stethoscopes, ophthalmoscopes, hypodermic syringes, and other simple instruments were rarely used by American practitioners. The military physicians continued to give their patients dangerous doses of potent laxatives and emetics, long after the substances had proved absolutely ineffective or harmful. A brave Union surgeon general, William Hammond, banned the use of two toxic drugs because they had severe side effects. He noticed profuse salivation and the development of gangrene of the gums, mouth and face, so he stopped the drugs. And for that he was court-martialed by the military and condemned by the American Medical Association. His crime was using his eyes to figure out that this stuff doesn't work.

The Union Army was so discouraged by the medical profession of its time that it did what most governing boards do when they are unhappy—it invented a test. The exam revealed to the Union Army generals that "the typical physician expressed vague and confused ideas in barbarous English that was in defiance of all rules of grammar." The standard course of instruction was looked into. What was it like for physicians then? It consisted of two four-month terms of lectures during the winter season, with the second term identical to the first. That is, they didn't know what to do, but they figured four months wasn't enough so they repeated it.

So ignorant of contemporary developments in science was a Harvard professor of pathology and anatomy in 1871 that he confessed his inability to use a microscope. At no school was there any gradation of studies or sequencing of subjects. There was simply no logical order. Instruction was didactic. Rote learning was emphasized. Students endured between six and eight hours of lectures daily, supplemented by textbook readings. There were few if any written examinations. To receive a medical degree, students merely needed to pass a brief set of casual, perfunctory oral questions. The age of 21 tended to be an official requirement for graduation, but not too much attention was actually paid to this.

State licensing did not exist. A graduate with a degree from any kind of institution could practice anywhere in the country. The ability to pay the fee was the single entrance requirement for many medical schools—and some would say it still is. Literacy was definitely not needed. Indeed, when Charles Eliot, the eminent Harvard professor, took over the presidency, he attacked its medical school. He proposed written examinations for graduation—and he was vigorously opposed by Harvard's professor of surgery who argued that more than half of Harvard's medical students could barely write.

In fact medical schools were so disreputable, and the profession so bad, that the best students chose careers in the clergy or teaching. As disreputable as we were, we were higher in the hierarchy than medicine. Eliot pointed out here's a lesson in how to endear yourself to your faculty—"an American physician or surgeon may be and often is a coarse and uncultivated person devoid of intellectual interest outside of his calling and quite unable to speak or write his mother tongue with accuracy." He described Harvard's medical school as "a money-making institution, not much better than a diploma mill." And he wrote, "The ignorance and general incompetency of the average graduate of American medical schools at the time when he receives the degree which turns him loose upon the community is something horrible to contemplate."

It sounds like our legislators in Arizona talking about our graduates of schools of education.

Eliot tried to put into effect the scientific M.D. degree, but he was voted down by his faculty. He wanted the new biology, he wanted anatomy and physiology, he tried to get in chemistry and pathology. The faculty voted him down. After all, the faculty argued, medicine was an art, not a science. An interesting comment. The faculty at Harvard said that the scientific approach was a fad, and it showed disdain for the clinical wisdom of America's physicians. Experimental research was roundly scorned. Some of the most eminent medical professors at this time stated that they did not accept the germ theory of disease; it was too silly to contemplate.

The handful of people doing research either had to be independently wealthy or had to steal equipment for their studies. Medical schools were not connected to hospitals until Johns Hopkins in 1880 or so.

Lawyers in those days also appeared to be rather despicable. The profession seemed to be run by the greedy and the conservative, though they often came from "a better class" than did physicians or teachers. A legal education was really no more rigorous than a medical education. It did not take much in the way of apprenticeship, and one only had to read a few books in order to be able to practice law.

It was also true in that same recent past—roughly 1870—everyone seemed to think that teachers were simply persons who were unfit for the rigors of farm, factory, or commercial life. What was clear in my little review was that to the vast majority of Americans there were three equally disreputable professions—medicine, law and education.

It's Our Turn Now

Now it's interesting to reflect on the idea that two of these professions gained some stature over the past 100 years. Physicians have become wealthy and respected, assuming the qualities of a priesthood—at times even a deity—because they have acquired knowledge, skills, concepts and technology that have allowed them to treat and to cure illness. Lawyers, although sometimes still retaining an unsavory image, have managed to climb the occupational hierarchy in terms of finance and prestige. In our modern society they possess knowledge and skill to respond to problems in commerce, finance, taxes and social behavior.

Now what about our third profession—education? I think—and this is the point of this whole discussion—that it's our turn now. We have something now, for the first time, that the ordinary person does not have: a knowledge base consisting of facts, of concepts, of technology, that can transform our profession as well. It's a time of intense criticism of education. Everybody keeps carping at us. As Mike Kirst said, it's the one

unusual exception to the rule that the public loses interest. It looks like every year they stay interested in our profession.

The transformation I have in mind is one where the research provides us with the kind of social status that is has provided medicine. We're haunted in education with the public's erroneous belief that someone can walk in off the street and deliver a curriculum to 30 or so children. People don't realize that there is something called pedagogical knowledge, and that it is a very unique form of knowledge. The public—all these people who may have raised a kid, trained a dog, taught a word to a nephew or niece—thinks that teaching is easy.

What most people don't have is experience with 30 kids who may have diverse cultural backgrounds, impoverished cultural backgrounds, lack of literacy skills or an array of literacy and health problems. And the public's image of pedagogical knowledge is non-existent. What we're developing in our field is some specialized form of pedagogical knowledge, and I think it will increase our status and our remuneration, just as it has in some other professions.

As the art of medicine has been enriched by a scientific underpinning, so is the art of teaching about to be enriched, I think. And it will always be an art. As family practice medicine is an art, so is teaching an art. But if family practice medicine didn't have a firm scientific underpinning, you wouldn't see your physician. And that's, I think, what we're developing in education now.

Educational Research Compared With Physics and Medicine

Let's put these ideas of mine to some tests. Let's ask some questions about this field and see where it leads us. How good is current research in comparison to physics or medicine? We're always denigrating ourselves and saying we're not a real science. Well, let's go up against some "real" sciences and see how our research looks. Let's ask what has it given us so far, or if any of it is of practical value. Let's ask how should we interpret it and how should we transmit it—and this is where I think the rural schools have a real advantage.

First, how good is our research in comparison to that of physics and medicine? Now, it's not often that a social scientist is willing to compare his work to physics. But an interesting study was done. About two years ago a researcher named Larry Hedges wrote an article that had a tremendous impact on me. It was called "How Hard Are the Hard Sciences, and How Soft Are the Soft Sciences?" He looked at education and at physics and started to compare them. And the way he compared them was interesting. He asked the question, how cumulative is the knowledge in these fields?

He looked at high energy physics as a case. And he said, okay, here's a field that spends billions on a single experiment. Let's look at some of their findings. Let's look at, say, the lifetime of the muon as a set of findings. Or the mass of the charged pion. Or the lifetime of the charged pion. And let's look at the number of studies—here are 10 studies of the muon, 13 studies of the lifetime of the charged kappa. And let's ask the question, do these studies hang together? Are they cumulative in nature?

If you remember some of your basic statistics, there was a very simple test for this. You take the data from a set of studies, you run a chi-square analysis, and what you're really asking is, is the data set you're looking at homogenous—that is, does the data seem to hang together?

Here are 11 studies of the charged pion, looking at the lifetime of the pion—how long it lasts in high energy physics. You run the chi-square. You look at the probability. And what you find out is that the probability is less than 1 in 1000 that this set of data could be considered homogenous. The conclusion: It doesn't hang together. It's really pretty wobbly. I went out and found a physicist friend and said, "Do you know your data doesn't hang together?" He said, "So?" I said, "How can you do anything?" He said, "We're doing great."

Data doesn't necessarily have to be perfect in order to be very useful. They say, "It's good enough. We're putting people on the moon, we're inventing crazy weapons, we have all sorts of new computers—our physics is fine, what's wrong with you?" If you notice things like the lifetime of the muon—the probability is so low you can't trust it. Things like the charged pion lifetime, the neutral pion lifetime, the mass of the lambda—can't trust the data. The point is that the data of high energy physics—one of the most revered, exciting, expensive sciences—doesn't hang together.

That's the hard sciences, what about the soft sciences? You can't get much softer than the social sciences, and of the social sciences, you can't get much softer than educational research. So let's start out with 62 studies of spatial perception by gender reported in an

article by Linn and Peterson. The probability is less than 1 in 1000 that they hang together. Looks like some problems there. Okay. Let's look at the softest of social science data—studies of open education versus traditional education. And to take a mushy area, let's look at self-concept. We take 18 studies of self-concept, compute the chi-square and look at the probability. And lo and behold, it's actually hanging together. The 18 studies of self-concept all give reasonably cumulative data. They tell us in fact with regularity that self-concept is almost always higher in open education classes than it is in traditional education classes.

Now, when you actually compare a set of social science studies with a set of high energy physics studies, you learn something remarkable. First of all, they look alike. High energy physics is no more cumulative and no more reliable than social science research. That is, if you do 20 studies in a field and ask, "Do they hang together," the answer is yes—at least to the same extent that physicists have data that hang together. In fact the social science data used actually looked better than the physics data by a slight degree. So from the standpoint of how we stack up against physics research, we do darn well. It's just that we expect our data to always hang together, and the physicists don't. We're applying higher quality standards to our research than many other scientists do. Hedges went on and to say, okay, we now know that our research hangs together pretty well, but we all know that social science research has measurement problems. My gosh, you can't measure anything in social science. We don't have absolute zero like the physicists do. When they talk about zero, they have a real zero. When you talk about raising a temperature five degrees, everyone knows what that is. When you talk about raising achievement five months, nobody in this room knows what that is. We have no absolute zero. Nobody knows what zero intelligence is—I suppose it's dead. Nobody knows what raising two points of intelligence means.

Then Hedges looked at the 1960 metals handbook and the 1970 metals handbook and he looked at the estimates for thermal conductivity of a whole set of elements. And what he was asking was, how well over this decade did their measurement techniques work for them? There were incredible breakthroughs during this time—thermal conductivity is important in all the electrical work going on now, all the computing work, molecular stuff. He looked at carbon, the most common element. Between 1961 and 1970 there was an 8000 percent difference in the measurement of carbon. Now I want to tell you, we make errors in education. But they're rarely 8000 percent. That's a measurement error beyond most that I know of.

You take some other factors—indium, 242 percent; iridium, 151 percent. The point of the study is that although we have measurement problems in education, so does everybody else. Our research in social science is really no better and no worse than research in the physical and chemical sciences. The hard sciences ain't so hard, and the soft sciences ain't so soft.

So our research stands up very well, if we're willing to treat it that way. We seem to hold this incredible belief that all research studies have to converge on a single kind of evidence, to be so conclusive as to say that we know exactly what we're doing. Chemists don't, and physicists don't, and they're perfectly happy that way. Maybe we need to re-evaluate the criteria we hold for our research.

What Education Can Learn From Medicine

Having looked at physics and chemistry, I want to look at medical research. And I'm going to use an argument made by my colleague N.L. Gage. What Gage noted a number of years back was based on the results of a large scale experiment with a drug called propanolol. Propanolol is a drug from a family of beta-blockers. It's used to increase the rate of survival for people who have had at least one heart attack. Some of you may be using it. It's now *de rigueur*. A physician who doesn't prescribe a drug like that after someone's had a heart attack could be sued for malpractice. What was the study like? There were random assignments of 3800 people to either the drug or a placebo treatment. The investigators used a double-blind procedure with about 1900 persons in each group. The cost: $20 million. I point that out because the entire Office of Education Research and Improvement (OERI) has a budget of about $54 million. After 30 months, 9.5 percent of the men who had received the placebo had died, while only 7 percent of those who had received the beta-blocker had died. The drug reduced the percentage of fatalities by 2.5 percent.

Now if this were an educational research finding, it would be considered trivial. Imagine going before a school board and saying, "We've reduced dropouts in our district by .5 percent, and it only cost you a million dollars." They'd say, "Cancel the program."

Medicine has a great criteria—dead. Everybody understands dead or alive. We have things like above grade level or retained in school. Those don't quite get the attention of the death rate. In the medical arena, the results of the propanolol study were regarded as so

important that the experiment was discontinued on ethical grounds. The researchers after 30 months—imagine, 30 months; we get six months to turn around a school—felt that their data was so strong that it was unethical to keep denying treatment to the control group. Their results led to the recommendation that propanolol be used for the potential saving of about 21,000 lives per year in the U.S. alone.

Notice what they did. They took a lousy 2.5 percent difference and they projected it. That's something medicine does and we don't. If I went to a school board and said, "We can reduce the dropout rate by 2.5 percent," they'd say, "Mmm, that's interesting." But what I also should have said was, "And that will save our community $38 million over the next 20 years." Because it's going to be something like that. And nationwide it could be in the billions in terms of taxes paid and incarcerations not paid for.

This study went on to say, "21,000 lives saved." Well that's not quite true with a two percent difference. To show you how we treat data differently in education, if you run a correlation coefficient on this table, the correlation is .045. You've all heard that correlations that low are useless. If I had gone to a major educational research journal and said, "I've spent 30 months on this project, and the kids are reading 2.5 percent better in this program than in the other program; the correlation between having the treatment and success is .04; and the percent of variance explained is two-tenths of one percent"—I'd probably be rejected from some journals because the results are trivial. I might not get it published. But in medicine it became accepted practice overnight.

If this doesn't make the case about the way we treat data in our field, let me give you one more. This is a study of cholesterol lowering. It took nine years. Any of you have studies that are allowed to go nine years? It cost over $150 million—about three years of the OERI budget. It dealt with the lowering of cholesterol through diet and the use of a drug. And here are the results:

They had about 1900 in the experimental group, 1900 in the placebo condition. Definite fatal or full heart attack appeared in 8.1 percent of the experimental group and in 9.8 percent of the placebo group. And they called this study a miracle study. I am not making up the term. For a lousy 1.7 percent difference, the results were considered so impressive that they made the front page of *The New York Times* and the *Boston Globe* and led to a cover story in *Time* magazine and an article in *Science* which held that the results of this study would "affect profoundly the practice of medicine in this country."

We get one percent differences all the time in educational research. But we keep looking for the equivalent of the cure for polio. And that doesn't happen in medicine or education very often. You're not going to wipe out whole diseases. Medicine makes its improvements by little percentages, small differences, except for the rare case of a vaccine. In education we keep looking for the vaccine and throwing out the one percent differences that I think we should be more proud of.

People take medical studies like this one to heart because they have to do with longevity. Each of you changes what you do because of information that has to do with one percent or one-tenth of one percent variances in longevity. Most of you have probably changed your diet. You've moved from red meat to chicken or fish. Many of you have started jogging and other exercise programs. The majority of you don't smoke, I would bet, and many of you have stopped smoking. I do all of those things. And I do them for a lousy one percent variance accounted for. If I really wanted to know something about longevity, I'd get my grandparents ages at death, I'd multiply by four, take an average of it, add about five years for medical science, and I'd have a real good estimate of how long I'm going to live. And for 18 days or 36 days or at most six or eight months, I do all of these things that are ruining my life, like dieting and jogging.

We do these things because we take longevity so seriously. But it is life and death to the kids of the country as well when we have one percent differences in a treatment—a new reading program, a new math program, a new way of restructuring the schools, one percent higher retention rates. It really is life or death, and we're the only ones who can make that argument. The public certainly takes longevity seriously and it doesn't take schooling seriously. But the nation's health is at stake. When we talk of a nation at risk, it's just like cholesterol in that sense. And we have to start treating our research the way the medical profession treats theirs—extrapolating it to the thousands and thousands of kids who will be improved by a finding that's just this small.

We have data in educational research of a 20 percent variance explained. The time on task literature, for example. Controlling for time on task, we often get 20 percent of the variance in achievement explained by how kids spend their time in school. That's 200 times more powerful than medical studies that are considered miracles. We have to put our research into a context for interpretation. We seem to be holding standards that are inappropriate.

What Educational Research Has Given Us

All right, I said I'd stack us up against physics and medicine, and I hope I've convinced you that we're probably not so bad. But we have other questions to ask of the research. The second question is, what has it given us so far? Well, I would argue that there are five characteristics of a scientific community. A scientific community serving the world of practice ought to be able to verify ideas everyone knows about—because there are good ideas always floating around in the world of practice. It also ought to be able to provide new ideas, complicate some things, simplify some things, and come up with some counterintuitive things.

So how about verifying existing ideas—do we do that well in education? Yes, we take some ideas that seem to be floating around and try to imbed them in richer interpretations. Take, for instance, one that was in the document that the president and some of his appointees gave us a couple of years ago called *What Works*. One point was, parents should read to their kids. Now that's not exactly the highest level idea I have ever heard expressed. And some people criticized *What Works* for having that kind of banal tone to it.

But the fact of the matter is, the research community has imbedded that little bit of advice in some very interesting ideas. We now know that kids who are read to a lot come to school with what might be called a story structure or scheme. They know that stories have beginnings, middles and ends, and that they have a certain continuity. They learn that there is a block in the environment that the hero or heroine has to overcome, and that often outsiders—elves, parents, angels—come in and intercede. What they learn is a way of conceptualizing stories. And when they go to school, they can learn from explanations being told to them in story form—that have that same quality.

So we take ideas that everyone seems to know about, and we verify them. And then we get villified sometimes because it sounds so banal. But you have to do that in a field. The notion that women can't do math is floating around. Everyone knows it. For years women were counseled out of it. But the research community came up with a very interesting finding. If women take math courses, they do as well as men. If you test them at age 18, women don't do as well as men. If you look at the women who have had the same amount of math as men, lo and behold, they've done as well.

There are lots of those. Like the time on task. I explained to my father that I was studying the way kids spend time in school, and he said, "You mean if they spend more time, they learn more." I said, "Yes." And he just laughed. He thought that was the funniest thing he'd ever heard and said anyone who would fund me was an idiot. The finding itself was trivial: spend more time, learn more. Any fool knows that. But what none of us knew at the time was that there was incredible variation across classrooms and districts in the way time was spent in schools. And that was worth understanding. So we do a lot of verifying of common sense things that "eveyone seems to know about." But as you all know, common sense is not necessarily common practice.

What about finding out new things? One that's come into the literature lately that wasn't even dreamed about ten years ago was the notion of reciprocal teaching. Reciprocal teaching, as described by Palinscar and Brown, looks something like this. Take 5th and 6th grade kids that can just barely decode a sentence and can't comprehend anything. They are at the 15th percentile nationally on a comprehension test on any of your standardized measures of reading. You work with them for 15 days, trying to get them to ask questions of the prose they're reading.

On the first day you learn that they can't even form a question. You give them a little paragraph about the camel, the ship of the desert, and you say, "Ask me a question about that." And the question might be, "The camel in the desert." So you spend 15 days getting them trained—a half hour a day in how to ask the who, what, when, where, how questions about a paragraph. At the end of the 15 days, you ask them to read something and ask a question and they can do it. And isn't it interesting—something else happens. They can answer all the questions on a comprehension test. They go from the 15th percentile up to about the 70th percentile in 15 days. How can you do that? Well it's easy. If you can ask the questions, you ought to be able to answer them. Nobody had ever given them the skills to figure that out. They had drifted along to 5th grade and they didn't know that.

Now we have in 15 days a miracle. Did you see it in the newspapers? If it were medicine, the headline would be "Miracle Drug Found." It's education. "Miracle Treatment Found." The stuff has been replicated, done in actual classrooms with actual teachers—not the experimenters—and kids go from the 15th percentile to the 50th percentile. If it were a medical drug, it would be

considered a miracle. In education, well, it's drifting down into the schools. We don't have the mechanisms to get it out there. I would argue that it's a brand new technology.

Ideas are new too. In education we don't just generate technology, we give you ideas as well. Let me give you one that Walter Doyle has discussed. He talked of taking a different metaphor into the schools about what classrooms are like. He talks of classrooms as places where students exchange performance for grades. That's an economic notion. If you realize that, then you can account for some funny things that happen in classrooms.

For example, a creative lesson will be started by a teacher—a new, bright teacher starting out a science process curriculum. And the kids say, "What are we supposed to know?" And the teacher says, "I don't know yet." The kids say, "What are we supposed to do?" And the teacher says, "I don't know, we're going to create it, we're going to take a field trip to the pond, we're going to collect things, we're going to write down our observations, and we're going to develop what we learn as we go along." The kids go bonkers. They start saying, "Are we going to be tested on this?" The teacher says, "Well, maybe." And the kids start to sweat. They say, "On what?" The teacher says, "We'll have a project."

The kids ask, "Can we work on it together?" "Can my parents help?" "Can I use references?" "Can I use the library?" What you see is a new concept emerge. It's called grade surety. Some kids—college-bound kids with upwardly mobile parents—have to have grade surety. They have pressure put on them for the A's and B's so they can get into college. These kids—when given a creative, open-ended, process-oriented lesson—destroy it. They destroy it because classrooms can be conceptualized as places for exchange of performance for grades. The teacher says, "I hold the grades. You give me the right performance, and I'll give you the grades you need." That's an implicit contract, like the economic systems we're all used to. When in fact that is violated by the teacher saying, "I don't have any grades, I don't know what we're doing, we'll see what happens, it'll emerge"—the kids go bonkers and rip the lesson down, and in two weeks the teacher is teaching a very pedestrian lesson out of the textbook. Because then the kid can exchange performance for grades, and he or she knows how to get an A.

I also said that a productive scientific community would expound on ideas that would complicate everyone's lives. One such study was done by Kessler and Quinn who evaluated the performance of barrio 5th graders in San Antonio in very complex language skills—the use of irony, metaphor and so forth. And the kids were evaluated against prep school 5th graders from New England. The prep school kids had a reading level of 7th grade; the barrio kids had a reading level of 3rd grade. Very sophisticated language use tests were administered to the two groups of kids. And the barrio kids, who were bilingual, outperformed the New England prep school kids, who were monolingual.

That's one of a dozen studies I can quote you that is now going to complicate our lives because it says every kid who is monolingual in this country is being cheated of some cognitive advantages. Now what do we do? It's not an issue of English only. It's not an issue of Spanish. It's an issue of bilingualism is better. Now what do we do?

How about some findings that simplify? We have the notion that the high school curriculum has gone so far overboard in offering electives that we'd be better off stopping the trend and doing in-depth work. This has implications for the rural schools where everybody's asked always to go into the large high schools, to somehow consolidate, so that kids can have electives. Well, I think that there is a trend emerging from both cognitive psychology and critics of education that says you're much better off building knowledge structures in an area in depth than having some breadth.

An example is, you can get a history course that teaches the Civil War, the Industrial Revolution, the Spanish American War, the preparation for World War I, the Great Depression—you can spend a week on all of these and the kid has a smattering of information, and can pass a test. It now seems reasonably obvious to a lot of people that if the teacher knows something about the Civil War, he or she ought to teach the Civil War for all six weeks. Or teach the six weeks on the Great Depression. Teach something in such depth that the kids can develop knowledge structures in depth that relate to the rest of their knowledge. This march through the curriculum, an eon a week, is probably a mistake.

The same thing is true of all these courses kids are taking. Instead of an introduction to this and an introduction to that, kids would be lots better off going into some areas in depth. That can simplify a curriculum. And for the rural educators, it can help you make a really good case that you can do a bang-up job educating right in your own communities without consolidating. I don't know if you want to do that, but I think a case can be made.

Now some counterintuitive things. This is the time of year where kids are going to be left back. They're going to be retained in grade. The public thinks this is wonderful, we've imposed standards with the reform movement. By God, we're finally leaving kids back who don't meet the standards. The state of Arizona this year will leave back an estimated 15,000 kids. The cost of leaving them back is $45 million. Every one of those kids is $3000 a year or so. We get a $45 million increase in budget by retaining them in grades. Well, but that's good for them, they say.

But here's the counterintuitive finding. The research evidence is absolutely, incredibly clear that if you are leaving back 15,000 kids, it's probably the wrong decision for 14,500 of them. It may be the right decision for a small number. If you have two kids who are of equal ability, low ability, or who have equal emotional problems—call them identical twins—and you promoted one and retained the other in grade, the one you promoted will probably be about 15 percentile points higher on all the standardized tests than the one you retained in grade, and would be about eight percentile points higher in virtually all the self-concept measures and liking-of-school measures.

Retention is the wrong decision, over and over again. I can muster 100 studies for you that are counterintuitive to the belief that if a kid's not performing well, might as well leave him or her back. The public seems to like that, legislators like that—and it's wrong, and it's expensive.

The Practical Value of Educational Research

What I wanted to get to is the question: does any of this have practical value? We're doing our duty as a scientific community by generating the kinds of things that the field needs.

But is any of it of practical value? What about the time-on-task literature. Or the success rate literature. Or the notion that academic feedback improves performance. Or studies on motivation and expectancy. What about wait-time—the amount of time a teacher waits between asking a good, meaty, higher-order question and calling on students. Is that of practical value?

Absolutely. The variance accounted for in those studies is often one and two and three and four and 20 percent. Far larger than the medical studies that are considered miracles. Wait-time alone correlates with achievement about .15 or .20. It has a one percent variance accounted for. So it's rather remarkable that nobody pays much attention to it. We have concepts of great utility. Biology has homeostasis. We have curriculum alignment, academic learning time, engaged time—we have concepts also that result in remarkably helpful ways of conceptualizing schools and classrooms.

We have technology just like medicine. Cooperative learning didn't exist 10 or 15 years ago. Cooperative learning is a full-fledged technology. It changes teachers' and students' lives. The classroom management literature that's come out of the University of Texas and published by Prentice Hall—considered a miracle by a 20-year veteran of the New York City schools. He finally read a book that made sense about how to run classrooms. Outcome-based instruction. All of these are technologies now available, but that the lay public doesn't know we have available. We have our own research literature, our own language, our own pedagogical knowledge.

How should we interpret these research findings? Carefully. Our research knowledge does differ from physics and chemistry in that it deals in human systems. You work with human beings and all kinds of strange things are going to happen. You put in a new research finding, and you get a new principal simultaneously. The research finding doesn't seem to hold up because everybody's worried about the new principal. Or you have a person implementing cooperative learning who's going through a divorce. What does that do to cooperative learning?

Over and over we have human problems entering our system in ways that the people running the linear accelerator at Stanford don't have. What does that mean? It means something similar to when you get a package in the mail stamped "Fragile, Handle With Care." That's the way to treat the research findings—handle them with care. They won't always hold true in Tucson, in Phoenix and Flagstaff. They might in two of the three, but not the third. That's okay. Medicine doesn't always work in practice the way it does in the laboratory either. People don't take medicine the way they're supposed to, they drink beer when they're not supposed to—and the medicine becomes inactive or twice as active.

Our research is fragile. It's imbedded in the human context. It has to be handled with care. But to ignore it is an incredible mistake.

My last issue is, how do we communicate all this? And I think we do in two ways. My colleague Gary Fenstermacher has talked of the ends of the continuum being either you impose it on people or you provide people with evidence and let them work with it. What's happened too often in education is that somebody's taken a research finding and imposed it. That's the wrong way. It won't be implemented, it won't become part of people's lives, it won't change their professional identities. What you need to do is present them with evidence when they say, "We're having trouble in the school around this thing, is there research evidence that can be discussed?"

And the issue is one of discussion. What we really are talking about is finding a way to get teachers to meet together and discuss these issues. To have study groups around research problems. And it's here that I think leadership is needed to get them started, but teachers have to take over these discussions. In other fields you get norms where people meet regularly. In Tempe the radiologists meet every month at the hospital and go over research. The other physicians meet regularly. Where are teachers meeting regularly to discuss the research that's important to them? To be confronted by evidence and to try to think about their own problems?

So I would say it can never be imposed, that's the wrong way to go. And I think the rural schools have an advantage because they don't lock up at three o'clock like some of our urban schools do. We have schools where teachers can't meet after school because there are safety problems. It seems to me that developing a school culture where people once a month sit down and deal with the research issues can make a vast difference.

In other words, we have a research community now that's generating useful things, and I think we have a profession that needs to come to grips with that in order to transform itself. I think the reason medicine gets its remuneration and status is because medicine possesses knowledge that the lay public doesn't have. And I really do think it's our turn now.

EDUCATIONAL TECHNOLOGY IN SCHOOL RESTRUCTURING ▪

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This is a talk that at one time or another was known as "The Great Potential of Technology in Education." Many of you may have given this kind of speech in the years from about 1980 up to 1985 or 1987. I gave it myself many times, but then there had to be a correction. We were a little bit overzealous. So I changed it to "The Myth of Technology in Education." And by now the speech is known as "Beyond the Myth of Technology in Education."

What that means is, there is a cadre of us out here now who've learned about technology. We've learned about education. And it's time for us to see how the two are going to fit together and to learn what role technology can play in this development.

To backtrack a little bit, how many remember *Time* magazine's cover: The Computer as Man of the Year. Remember what year that was? It was 1983. The IBM PC had come out the previous year. Apple II was well on its way to getting into schools and into homes. This was sort of the glory time for computers. Interestingly enough, the word we heard over and over again at this conference yesterday was not computers but telecommunications. So you can see that times have changed.

In fact, as George Leonard predicted very wisely in 1984, "Strange as it may seem, it is entirely possible to put millions of computers in schools without producing any real educational change." Now, a lot of us who went into this business realized that it was always a good hustle. It was motherhood and apple pie. You could get any kind of money for technology. And we've done it. We've put two million computers in. Other prognosticators have addressed this same issue:

—In Derek Bok's presidential paper at Harvard in 1985, he wrote that there are three reasons why technology failed to live up to early hopes: resistance by teachers, high cost, and the absence of demonstrable gains in student achievement.

—Harold Hodgkinson, who has made a wonderful career as a speaker and demographer indulging us with the facts of the transformation of the American population, said that while the U.S. has gotten computers into schools more quickly than perhaps any other country, they are not necessarily in the classrooms. That is very true. In the main, they were put in labs. A new species of subject emerged called computer literacy which feeds out technological, geographic, and scientific literacy as a separate component to be introduced into the curriculum. We have that going on in a lot of schools now, but we don't have much else.

The Old Way: Technology as the Solution

It shouldn't be that much of a surprise that technology all by itself in the form of computers didn't do much. Here's an article that came out in *The New York Times* on June 20, 1987: "Services Hurt by Technology: Productivity is Declining." Obviously our goals in education are to improve teaching and learning. We want that to happen better and more efficiently. But here it wasn't happening as in other industries.

Then we all got hit by this type of article last year from the *Wall Street Journal*: "Computers Failing as Teaching Aids." Now this is one of those classics where the headline doesn't exactly correspond to the article, but the headline all by itself was quite damaging.

Why would this kind of development occur? We've had certain trends in the use of computers in education. All through the 1970s I was teaching computer science. Then in 1982 we said, all right, now we're going to teach computer literacy. We had a lot of programs like that, but then many people in the field said, no, that's not the way it should be. Computers should be a tool. So in 1984 we started talking about computers as a tool. And in 1985 we started talking in the literature about integrating computers into the curriculum. The one thing we hadn't done—and which we're starting to do—is talk about this: Using technology to change schooling. To change the way teachers teach and students learn.

Certain people have been writing about this really well. Lewis Perelman—who sometimes gets confused with me—put out a paper from the National School Boards Association's Institute for the Transfer of Technology in Education. Lew points out a lot of interesting things, but the main thing is, he grounds the theory of technology in schooling with the theory current in Europe that's called socio-technic systems. That is, you can't approach the problem simply from the view of the technology. You have to look at the social relationships at the job, and the technology has to fit that kind of construct.

There's a wonderful movie showing vignettes in the workplace in Scandinavia called "Computers in Context." It shows computers being introduced in different workplaces in Scandinavian industry, such as among graphic artists at a major newspaper. The technology was put in, and it de-skilled the graphic artists. It caused lots of labor unrest. It changed the way the work was being done, but in a way that was negative for the employees. Then they formed a committee of the graphic artists and management and discussed how to use the technology to up-skill these workers—to help them do their jobs better. As a result, they put in a new software system that was not displacement of task but decision support and productivity support for those workers. Now it's become a living, breathing and very exciting system.

This same point is made in a new book by a Harvard professor named Shoshana Zuboff. In her book—*In the Age of the Smart Machine*—she coined the word "informate." It means organizing to exploit information technology. And when you think about it, there's a nice paradigm there. You can go out and buy technology right now. You can buy lots of computers, telecommunications networks—the whole construct. It costs a lot of money. And the question is, are your employees—your managers and workers—organized in such a way that they can exploit those technologies? In other words, can they use them in a productive way?

I'm sure many of you can go into offices anywhere and see computers on every person's desk. Beautiful pieces of furniture—unexploited. The people aren't trained. They wanted computers for status, but they didn't really know how they were going to use them. What Zuboff says is that "management must change gears—from enforcement to the creation and promotion of an environment that induces commitment to the organization and that fosters internal motivation in the workforce."

Now these themes are starting to emerge in the educational technology community. I live in both worlds—the educational technology community and the restructuring community. My job for the AFT is to sort of broker between these two worlds. I speak one way to one world, another way to the other. Increasingly, though, there are conferences like this which are merging these themes.

About a year ago, a Minnesota conference for educational technologists had my boss, Al Shanker, for their keynote speaker because they wanted someone from the educational restructuring community to talk to them. The National School Boards unit has been running conferences now for a couple of years called "Making Schools More Productive." One was in Dallas in November. Those are excellent conferences which bring out both of these themes. The new Center on Technology and Education—now run by Bank Street College which replaces Harvard as the national educational technology center—strikes a new theme. They're going to work on projects that will take place with schools that are already restructuring on some dimensions. They plan to work with the Rochester public schools to identify productive ways of using technology for student achievement in concert with that district's major restructuring effort.

So this theme is starting to show up. And I consider this conference another example of it.

The New Way: Technology As a Means to an End

Many schools approach the issue by asking, "What technology can we put in to transform this situation?" What happens if you start instead with the design of the schooling process?

A number of new schools have emerged around the country in the past several years. There's the Apple Classroom of Tomorrow (ACOT) project from Apple—a project in which students intensively use computers. Every student might have a computer to use at school and also one at home. Project Headlight by Seymour Papert of MIT is based on the same idea, but uses IBM computers. These projects have changed considerably over the years in what they're doing and how they're organizing. Hyperschool is a school in Columbus, Ohio which the Apple multimedia marketing group has seeded. They're using multimedia as a way of changing the learning process.

Saturn and Chiron are two schools that will start up this fall—one in St. Paul and the other in Minneapolis. These schools are very different from all the others in that they start not from the technology but from the actual learning process. Curiously enough, we talked a lot about school choice yesterday, and some people think choice is another idea drifting out of Minnesota. California may have its weird politics, but Minnesota seems to have all these interesting educational ideas. I went there to try to figure out why that is the case, and the only thing anyone could come up with is that it's cold in the Twin Cities. So they sit around discussing educational ideas.

The Saturn School in St. Paul will open up this fall as a school for grades four, five and six. It will be organized in such a way that every student has a personal growth plan—one similar in notion to an IEP, but ever-changeable, not fixed, and worked out with parents and the kids. In fact Saturn is working with a company called Peak Solutions to develop artificial intelligence software that will help teachers and students do goal setting—not only on a long-term basis, but on a weekly basis. A student will come in at the beginning of the week, get on the system, look at all the learning activities that he can participate in that day or that week, see the suggestions made by the teachers and then actually pick the learning activities—which might be cooperative in nature—that he will engage in. There's a lot of choice built into the system. Kids will choose the activities they want. And the program will be built over time.

Saturn's aim is to build a new school setting and a new schooling process designed to produce learning success for each student. It does not attempt to fit promising innovation into traditional practice. The school is going to be located in a downtown shopping center on a floor of a mall. In downtown St. Paul, all the buildings are connected by a skyway to all the other buildings, so you can walk through the skyway to the museum, the hospital, a business or a bank. The design is set up so that all the activities will be real-life ones, built around those sites.

A very similar philosophy emerges in the Chiron Middle School. This is a project started by a guy named Ray Harris, a real estate developer who is very active in Minnesota circles. He brought together a steering committee made up of the teacher union president, Louise Sunden, teachers in the Minneapolis district, and a number of key consultants in the area. Many of you might know one of them, Joe Nathan, who is associated with the national choice movement. This steering committee did an interesting thing. They held a competition for ideas. Harris financed it. Any group in America—teachers, administrators, anybody—could put forth the idea for the new Chiron school. There was a $1000 award offered for five different groups from anywhere in the U.S. Only one, as it turned out, was from outside the Minneapolis area.

Then they had a second round in which each of those five groups got $1000 to work on upgrading their proposal. Finally, they selected the best proposal. They weren't bound by it, but they got a lot of people invested in nurturing ideas for how this school would be designed.

What's different about this school is that its focus will be on experiential learning and learning by application. It won't be organized as a single site school. There will be five sites throughout the community—at the zoo, the hospital, the downtown business area, the government area. They may have other kinds of alternative and roving sites as well. The school's 300 kids, all in grades five, six and seven, will be divided into groups of 60. The 60 kids will rotate every 9 weeks between the sites. Each site will have a permanent site teacher and a permanent site paraprofessional who will develop the program. At the zoo, for instance, they'll get local volunteers, they'll design projects around the site—they'll be there permanently over many years.

Traveling with the group will be a home-based teacher and a home-based paraprofessional. So there will be two adults who will always be with those 60 kids, not just that year but over several years. They will get to know those kids and their families. One impact teacher from the school district will come in and work in a nine-week cycle—in order to fertilize the rest of the district. There will be five adults for each 60 kids—a one to twelve ratio—and a lot of volunteers.

The idea is, the kids will do learning activities at the site. At the zoo, for instance, they'll study animals, keep data on animals, make presentations about the zoo's problems, develop films, videos, newspapers, publications—do all sorts of real-life activities associated with the site.

Students as Active Educational Workers

I'm stressing these models not because they are the end-all of ideas, but because I want to show you their school design notion. They are redesigning the teaching and learning process to get away from the usual frontal learning and get more into experiential learning. So what about technology? Well, if you look at the budgets for these two schools, you find that you've never seen a higher budget for technology. It's enormous. And it's all start-up. Chiron is going to spend $300,000 of its start-up money for technology. What kind? Not one computer for every kid, but the tools they need to do the jobs that we've been talking about—namely, tools to capture images and information, to develop and present that information, to make videos and publications. So we're talking desktop publishing and things like camcorders, so they can go out and capture information from the community.

The Saturn school has several partners, including Apple Computer Corporation, Pioneer Communications, Control Data Corporation, and Peak Solutions. The school is organized in such a way that it will make tremendous use of technology, but the technology will be used to develop the learning activities.

Now taking that idea, what are the preconditions for this kind of development? There are two important notions, if you're going to think about reorganizing the school in order to exploit the technology. The first has to do with the students. And the second has to do with the teachers.

Here's a quote from Mary Alice White, director of the Electronic Learning Center at Columbia University: "We need not integration into the curriculum, we need to change the way we teach and learn. What is missing is a conception of how technology can change schooling." In regard to the students, that might be along the lines of what Al Shanker has been talking about. He says: "It's time to move away from debates about delivering teaching and think about what makes for effective learning. It's time to ask how schools can be restructured so that youngsters will be turned from passive into active students who can and will do the work that they must do if they are to educate themselves."

The paradigm shifts to active learners. Eliot Soloway, who is at the University of Michigan, talks about doing history, not just reading about history. Doing science, not just reading about science. So let's shift the notion to kids as active educational workers and find some examples of what that might look like.

The first one I want to talk about is the National Kids' Network which was set up by the National Geographic Society and the Technical Education Research Centers of Cambridge, Massachusetts, as a collaboration which was recently awarded one of the four Star Schools grants. Under the network last year, kids at 200 schools throughout the country, working in teams, took water samples from local rivers, lakes, ponds, open fields, and water taps. Back in their classrooms, the teams measured the pH levels of the water, recorded the results, and took averages for the samples. Then each team entered its results into a specially designed software program that allowed the class to average results and then telecommunicate them—via modem—to a national computer.

The next day the results from all sites were available for download from the national computer to the classroom computer, where they could be printed out and where special mapping software could generate color-coded national maps of acid rain levels. Students then discussed the findings and communicated their analysis, again via modem, to a national expert at the National Oceanic and Atmospheric Administration who wrote back and compared their findings to current scientific analysis.

These kids have more data on acid rain than the EPA. They were able to put out a newspaper and send it to their parents, showing them, "Here's what we learned about acidity in our community." These kids are active learners. And this year the project will expand to 2000 schools.

Another example of kids becoming active learners is the Grapevine project at San Francisco's Lowell High School. There, an English teacher teaching *The Grapes of Wrath* wanted the kids to really get some sense of the Depression Era. They began producing a videodisc, using old photos and film strips, to recreate the sights and sounds of the Depression and to build a hypercard database of information of 1930s. They did what can now be done by any group of teachers and

students in America. Students and teachers together can produce a film of the sights and sounds and history of their own community. They can gather documents, pictures, film sequences, songs, audio segments such as speeches and interviews, and use image, audio and digitizing technology to build a videodisc.

These are kids engaged in doing history. They're the creators. And the idea has many, many applications. You can use what I call the multi-media sandbox—equipment you can find around the house such as camcorders, VCRs, APPLE computers, TV and editing equipment. In a rural town called Blue Earth, Minnesota, the kids made a promotional video for the town. This kind of thing can be done in other rural areas. Students can go out to a local polluted river, film it, and tell its story. This kind of communicating uses the skills of the 20th century.

We heard Ron Knutson talking yesterday about the need to create leadership in rural areas. The idea here is, if kids can go out and learn about their communities, document what they're learning, and then present that to others—those are what we call leadership skills. They become self-documenting journalists, anthropologists, technicians. They turn into active learners and producers.

Teachers and Technology

Now I want to talk about teachers. Mike Kirst asked yesterday, where's the bottom-up constituency for technology? Do the people you may be buying technology for want to use it, and are they willing to fight for the budget to keep it? It's amazing how many bills have been snagged in state legislatures when a fight occurs between people promoting a technology bill in education and those promoting general aid—because the teachers' organizations will fight for the general aid so that salaries are maintained.

But to talk about teachers, we have to first talk about the technology transfer gap. All of the technology we're talking about came from development for industry. It then shifted to teacher educators who tried to disseminate it to teachers in order to put it into practice in the classroom. This is the transfer circuit. And along that loop, there are problems. Someone from a technology company comes to a school, puts on a presentation, and says, "You should buy all these things." The image that technology companies have of school buyers is a superintendent with a calculator trying to figure out how many teachers he can save. But suppose you improve that image. Suppose that superintendent is thinking instead, "Well, I can really make this thing go if I can put this technology in place." You're still left with the question, where are the teachers? Where in this loop are the people who are supposed to exploit these things?

Let's do a little exercise. Imagine what's available—computers for students, computers for teachers, software, integrated learning systems, local area networks, VCRs, videodiscs, distance learning. What's the primary thing that superintendents and school boards are going to buy? What about the technology people who are the coordinators in districts—do they buy anything different from what the superintendents buy? Mostly, both of these groups are focused on the kid problem. How are we going to get computers into the hands of kids.

Now, let's think if the buyers are instead teachers. A crazy idea. Teachers have got some money—what are they going to buy? A VCR, right? "Hey, maybe I can present some stuff. Maybe I'll buy a videodisc player—I'll make a presentation. Maybe I'll buy a computer for me to run some things, like software on critical thinking or on running discussions." So the teacher would think of it from a different angle.

Let's imagine if there were a team of teachers at a teacher-run school or a school within a school. What are they going to buy? They'll buy the teacher stuff, maybe the student stuff. They might even buy an integrated learning system. You can start to shift the focus in your district in this direction—and I've been advocating this around the country. Get technology-smart teachers, put out requests for proposals, let them come up with their ideas, let them buy what they want to buy in order to do the things that they think will change schools. Let them own the technology.

David Dockterman, who has done a lot of the design work for Tom Snyder Productions, says, "the computer is an invaluable productivity tool for middle managers in business. Why can't it be the same for teachers in schools?" He points out that you should look at the functionality of teachers and ask, what can a good teacher do with a computer? Obviously if a teacher had a computer, he or she could do all his or her own work, do demonstrations, and run good discussions by running off simulations from a single computer.

From that point of view, you can see that teachers could possibly do a lot with computers. Imagine a teacher work station in a school. They might do presen-

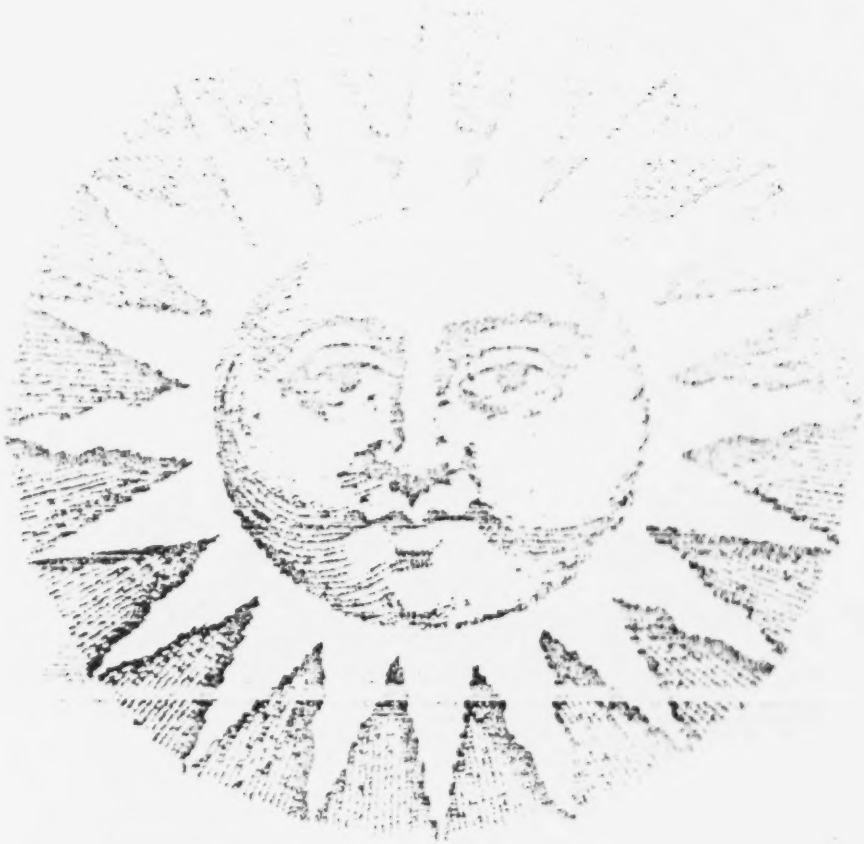
tations using imagery with videodiscs or VCRs, they might be promoting dialogue and discussion. They might be doing curriculum development and using desktop publishing to do it. They might even be so proud of what they've produced that they might share it with someone else. They might put it on a scanner and send that image over a telecommunications network to someone else. They might want to discuss their work with colleagues—imagine a phone line connecting their work station with the world. And they might want to share these resources with students.

I am an urban person, not an expert on rural schools. But I know something about telecommunications. There is a notion that telecommunications or distance learning is one-way course delivery—delivering courses to students. But teams of teachers might buy computer-managed instructional systems, not to supplant teaching and other forms of learning, but instead to serve as a platform for self-directed learning, for tutoring, and sometimes just for old-fashioned "drill and practice." Or they might use DISCOURSE, a technology with small terminals on each student's desk that enhances communications and facilitates the transfer of information, such as testing, in classroom settings.

And teachers in restructured schools will take a new interest in distance learning, a technology that some mistakenly believe will supplant teachers in their districts. Instead, restructuring teachers will use this technology to team-teach across wide regions, to facilitate student projects and activities, and to engage in joint professional development activities—from large-scale teleconferences to small-scale, one-on-one mentoring over two-way video.

All of this means that the role of teachers will be expanded. When students are treated as active workers, the expertise of teachers becomes ever more critical in facilitating student learning. Teachers, therefore, need to assume greater responsibility and authority for decisions about the kind of technology that most appropriately supports their expanded role. And to do that, they will need greater access to, and training for, the technologies that are now available.

So if you're going to restructure schools, reorganize in a way that enables teachers and students to exploit the information technology. Technology by itself won't change schools. But it can support teachers as they design student learning activities to turn students into active educational workers and turn teachers into facilitators and coaches of student learning. Those schools that redesign the schooling process will be best positioned to "informate"—to exploit fully the potential of educational technology.



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